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A REVIEW OF TAMIL NADU ECONOMY: 1970—1977

SOME RANDOM THOUGHTS ON THE ECONOMICS OF BIOFUELS IN THE ENERGY SYSTEM

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EDITORIAL—SOME HIGH LIGHTS

I General Economic Scene

State :

Draft Sixth Plan: In accordance with timetable agreed to by NDC, the State Planning Commission set forth in December the outlines of the Draft Sixth Plan for Tamil Nadu for 1978–83. The Draft Plan proposes a total outlay of Rs. 2,500 crores, compared to Fifth Plan outlay of Rs. 1,122 crores, with power development receiving an allocation of 41 per cent compared to 31 per cent in the last Plan, agriculture and allied activities 14 per cent and irrigation 8 per cent. The Plan in the public and private sector would generate employment for 27 lakh persons, reducing unemployment from 26 lakhs in March 31, 1978 to 11 lakhs by March 31, 1983. As against 53.3 per cent living below the poverty line, the Plan would reduce that percentage marginally to 50. State income is projected to increase from Rs. 1,732.84 crores to Rs. 2,078.33 crores during the Plan period, with agricultural income increasing two per cent annually and industrial income 4 per cent per annum. The Draft Plan is under review by the state govrenment, which will be forwarding its definitive proposals to the Union Planning Commission by the end of December.

Power: The power situation in the state in December was normal, except for interruptions imposed by having had to turn power off in areas flooded by the unusual and unseasonal December rains. The state Electricity Board reports that during the last 12 months, there was a 14 per cent increase in industrial consumption of electricity, which was met largely by the purchase of power from Kerala. The Board also reports that the transformers at power sub-stations are being equipped with load tap changers to ensure stable voltage in transmission. There is a demand that street lighting all over the state should be made the responsibility of the Board (at present it is that of the local authorities), with a plan to use vapour lamps to suit rural areas, 98 per cent of which, it is claimed, has been electrified. During December the state government signed power agreements with two neighbouring states. Kerala and Tamil Nadu agreed that 75 per cent of Kerala's surplus power, amounting to 1,200 million units would be made available to Tamil Nadu, while the balance of 300 million units would go to Karnataka. The price of Kerala power will be increased from 15 paise to 18 paise per unit. Also Tamil Nadu and

Andhra Pradesh finalised a barter agreement under which for 2 years Andhra Pradesh will supply 120 million units a year for use of MALCO in return for which it will receive 6000 tonnes of aluminium per annum.

For the country, the Union government reports an improvement in the general power situation. During the period April–November 1978–79, power generation is reported to have increased by 18 per cent over the corresponding period in 1977–78, with hydelpower generation increasing by 30 per cent and 8 per cent increase in thermal plants in November. Karnataka announced a 5 year plan involving no power cut except on high tension consumers of more than 250 KVA, based mainly on the Kalinadi power being available from mid 1979 and the agreement to buy power from Kerala referred to earlier. In December, senior executives of the Electricity Boards of the Four southern states attended a fortnight management training programme at Bangalore on use of better management practices in construction operation and maintenance of electricity undertakings. The Rajasthan Board reports that the Rs. 160 crore Kota thermal power project will start functioning in 1981, initially with 2 units producing 110 MW each. There was some disruption of power supply in Uttar Pradesh due to the strike of the staff in the second half of December as well as plant breakdowns. Haryana reports a five year power plan which will increase its generating capacity to the point when there will be no power shortage in the state. These include the construction of the second and third unit at Panipat which becomes operational in January, and increased capacity at Faridabad and a new plant at Yamunanagar. Meanwhile in December the Board reports that the non-availability of reinforced cement concrete poles, conductors, transformers have affected its programme to improve power quality to rural areas, minimise line losses and reduce incidence of voltage fluctuations and trippings.

Rains and Water: December was a month of quite unusual and heavy rains, both at the beginning and at the end. Thanjavur district received heavy rains in the first week. Similarly Tiruchirapalli district had rains at that time, as did South Arcot, Chingleput and Madras. During the last week in December, there was over a week of very heavy rains all over the state and in certain parts there was a record rainfall in relation to over two decades. The districts of Tiruchirapalli, Thanjavur, Pudokottai, Chingleput and North Arcot and Madras received a daily rainfall averaging 249 mm. All irrigation tanks and reservoirs in the state are full and watch is being kept on them to see if there are any signs of breaches. Mettur's level was 108 feet against its full capacity of 120 feet, Amaravathi was 108.8 against its full 110 feet, Bhavani Sagar 104.82 feet against its capacity of 105 feet, Krishnagiri 51.8 feet against 52 feet full capacity, Sathanur 119 feet with its full capacity, Papanasam 147 feet also its full capacity, Manimuthar 116 feet against its 118 feet. Chambarambakkam lake was 22.4 feet against its capacity of 22 feet and was surplussing into the Adyar river. Madras city reservoirs are full and city is assured of its daily 50 million gallons. The city life was seriously disrupted because of the standing water caused by the rains. The government announced a Rs. 30 crore plan to build a net work of storm water

drains to prevent water logging and to raise the level of some roads to prevent inundation. The state government has asked the Karnataka government to take up at an early date work on soil conservation on the Couvery bank to prevent the silting up of the Mettur reservoirs. Trees have been planted on the Tamil Nadu side of the river to prevent soil erosion and silting of the reservoir and similar action is needed by the Karnataka government for the other side.

Transport: The government announced an increase in roads allocation for next year to improve their maintenance in the state. On the railway front, in early December, the Southern Railway faced critical coal shortage and cancelled all trains in the Olavakot division. With the slight improvement in coal supply to the Southern Railway, 12 passenger trains which had been suspended were restored from mid December and all mail and express trains strengthened by attaching additional coaches. Southern Railway also announced that sub-urban electric train services upto Gummudipoondi and Tiruvellore will begin operation from June 1979. The Moore Market area was taken over in December for expansion of the Madras Central Station. The question of the rapid transit system for Madras (see VIII p 318) is being held up because of financial constraints but the execution of a part of it between Madras Port and Triplicane, as a first stage at a cost of Rs. 21 lakhs is being urged. The dislocation to the railway line in the Nilgiris (see last issue p 1) is now being repaired and it is expected that the railway service to Ooty will be resumed from January. Among the sea ports in the state, the Tuticorin New Harbour is emerging as a quick despatch centre. FCI reports that fast loading of its shipments of wheat to USSR, similarly the Indian Sugar Industry Export Corporation its sugar exports to Sri Lanka and Indonesia, and in one day the port reports handling through manual loading a record 4,364 tonnes. Against a revenue receipts of Rs. 127 lakhs, and expenditure of Rs. 82 lakhs for 1977-78, for 1978-79 the revenue will be Rs. 179 lakhs and expenditure of Rs. 98 lakhs. In 1977-78 the traffic was 6.37 lakh tonnes and for April-November 1978-79 the traffic was 6.57 lakh tonnes, earning Rs. 98 lakhs. The permanent oil jetty at the north break waters costing Rs. 97.50 lakhs will be commissioned in March and the Rs. 297 lakh coal jetty is to be begun to receive coal for the coal thermal plant.

MMDA: MMDA's new town, Maraimalainagar, 43 kilometres from Madras, which is to check migration into the city is nearing completion, with houses and roads in first of 12 neighbourhoods coming up fast. Roads, sewer lines, and public sector units plots, electricity lines and transformers are now ready. Out of 236 plots for Low Income Group houses, 144 plots houses are under construction. The town is now ready to accommodate 10,000 persons and by 1991 will house 1,00,000.

Welfare: The proposal for a dry belt around the state put forth at the zonal meeting by the Tamil Nadu government (see Vol VIII p 570) has not been accepted by Kerala, which has also not accepted by the Union government's policy to introduce prohibition within a 4 year period. The government of Kerala points out that instituting the dry belt will lead to loss of revenue and unemployment of thousands of toddy tappers.

National :

Sixth Plan: The consultative committee of Parliament was informed that the Draft Sixth Plan will be finalised and presented to NDC in March 1979. The annual Plan for 1978-79 now under execution is being followed by the annual Plan for 1979-80 now being formulated along with projections for major sectors for 1983-84, taking into account the achievements to date. The commission also intends to follow the lead of the Seventh Finance Commission in regard to the criteria for Plan assistance by giving lower weightage to population and a higher one to poverty and backwardness. This would mean replacement of the Gadgil formula and bringing the distribution criteria for non-Plan as well as Plan funds into line with each other. It will be recalled that while the Gadgil formula, gave population a weightage of 60 per cent, per capita income 10 per cent, continuing irrigation and power schemes 10 per cent, per-capita tax effort 10 per cent, and special problems 10 per cent, the Finance Commission assigned a 25 per cent weight to each of the following 4 factors: (i) population; (ii) per capita income; (iii) percentage of poor as worked out by a method evolved by the Commission and (iv) a formula of revenue equalisation worked out by the Commission (see last issue pp 5 and 6). The financial implications of the Sixth Plan involve raising Rs. 13,000 crores as additional resources (in addition to the anticipated surpluses as current reserves over expenditures), mainly because of the expansion of the public sector (from Rs. 900 crores in 1950-51 to Rs. 23, 000 crores in 1977-78) and this means a rather heavy dose of new taxes in the coming budget. The Draft Plan was examined in December at a meeting of economists, with particular reference to the sectoral job creation projections and the growth ratio between wage goods and non-wage goods sectors. The latter ratio of 4:7 was discussed indepth and the high investment rate for the non-wage goods sector was seen as being necessiated not only by the usual ICOR factor but for sustaining the growth of the wage goods sector itself. The key issue is the need to restrain the consumption of not only the rich but also of the not so poor.

Prices and Anti-inflation: The index of wholesale prices for the month of November 1978 stood at 184.7 on December 2, showing a decline for the month of 1.4 per cent. The largest decline was in primary articles of 2.4 per cent (pulses -5.1, oil seeds -1.4, fibres -0.7 and cereals -0.4). There was no change in fuel, power, lights and lubricants. Manufactured products group recorded a decline of 0.9 per cent, with a sharp fall in sugar (-9.2) and edible oils (-0.8), while paper rose by 4 per cent and basic industrial chemicals and electrical machinery rose by 1.3 and 1.1 per cent. Some of the inflationary factors are the rather large budget deficit for the current year which was estimated at Rs. 1,050 crores, with hopes that it could be covered wholly or in part (see Vol VIII p 205) but which on the contrary is likely to be of the order of Rs. 2,000 crores, some part of which has been due to the heavy expenditure on account of floods. Wheat prices also increased from December 1 by Rs. 5 per quintal the new issue price being Rs. 130 per quintal, and with the increase in the procurement price of Rs. 2.50 per quintal as recommended by Agricultural Prices Commission (see last

issue pp 19 and 20), the food subsidy cost is likely to rise from Rs. 500 crores in 1977-78 to Rs. 600 crores in 1978-79. RBI in its annual report for 1977-78 calls attention to the high, 18.4 per cent, increase in money supply for the year, compared to the previous year's increase of 16.6 per cent. Also money supply on December 1 continued at a high Rs. 19, 792 crores compared to Rs. 17,052 crores on December 2, 1977; bank credit to the government declined by Rs. 124 crores, that to the private sector rose by Rs. 292 crores during December. Some of the anti-inflationary measures during the month include the restraints imposed by RBI on further expansion of credit referred to in the last issue, the massive Rs. 160 crores project for restructuring and marketing edible oil and linseed in order to increase supplies and lower prices, a process which will be aided by improved domestic production which counters higher international prices, the strengthened public distribution system, the steps taken to import pulses in order to increase availability and push down prices and the increased subsidy for handlooms in order to lower the price of controlled cloth. The decline in wholesale prices is not reflected in retail prices because, as RBI points out, it is not pronounced widespread and sustained enough.

Economy: The annual RBI report for 1977-78 refers to the higher 6 per cent growth rate of real national income than the averages of five per cent in the Draft Plan, along with fact of its composition, reflecting the record agricultural production of the year due to good climatic reasons, showing the growth to be a parlous and unbalanced one. Despite money incomes growing at a higher rate than in the previous year, aggregate domestic savings declined from 17.9 per cent to 15.6 per cent of national income due mainly to the fall in the financial saving of the household sector. Even so, as in the past 2 years, aggregate savings exceeded domestic investment, but the net outflow of resources was lower. The report calls attention to the slackening in the pace of accretion to reserves in the last quarter of the financial year-against the January-March 1978 increase of Rs. 501 crores and the April-June 1977 increase of Rs. 719 crores, the April-June 1978 increase was only Rs. 19 crores (giving rise to the view that smuggling and non-official transmittals of foreign currency are once more under way). Against this background, RBI states that the level of foreign exchange reserves at Rs. 4,500 crores on June 30, 1978 appears comfortable but is not really so because India has no access to secondary reserves such as swap lines of credit and large scale borrowing in private international capital markets. Bearing in mind the large adverse trade balance and the declining foreign remittance facing the country, the foreign exchange reserve is not large. The NCAER review of the economy agrees with that of the RBI as far as the 1977-78 growth rate of 6 per cent is concerned but forecasts that for 1978-79 it is likely to be 3 per cent, since food grains production at 126 million tonnes (compared to 1977-78 125.6 million tonnes) will mean zero agricultural growth. But industrial growth which was a low 3.9 per cent in 1977-78, could be double that for the current year. Here RBI points out that it is only as public sector investment outlays proposed under the Plan gain momentum and their spread effect is established that the economy will be fully free from its sluggishness. Even so as the tempo of

investment activity picks up, certain infrastructural inadequacies, such as power generation, coal availability, industrial sickness are likely to become more pronounced and need to be attended to. Exports are lagging and NCAER points out that the protectionist policies of Europe and USA are no excuse because India itself followed such policies for over 3 decades, which involves change in the pattern of our export trade and the liberalised import policy should be used to strengthened the production base of the economy.

Industry: For the six months, April–September 1978–79, the ministry of industry reports an industrial growth of 8.3 per cent but the ministry of finance a rate of 9.2 per cent. The industry ministry also reports that the November 1978 rate was 10 per cent, compared to November 1977. Aluminium at 14.7 per cent, cotton textile 17 per cent, vanaspathi 30.2 per cent, fertilisers 12.5–25 per cent, motor vehicles 18.5 per cent were doing well above 10 per cent. Coal is picking up from the flood ravages, with an increase of 12.2 per cent over October, and steel by 2 per cent. The finance ministry survey of individual industry performance conforms to this outline, with power electricity increasing by 11.4 per cent while cement declined by 0.6 per cent and petroleum products by 2.6 per cent. In order to ensure that large industrial houses maximise the level of their contributions when promoting new projects or expanding existing ones, the finance ministry in December clarified the debt-equity ratio guidelines to mean that when the investment is Rs. 10 crores and above, the ratio will be 2:1 when below Rs. 5 crores between 1:1 and 1.5:1 and when Rs. 5 crores – Rs. 10 crores between 1.5:1 and 2:1. The 1973 February industrial policy statement (see Vol III pp 240-242) sets forth the industries in which large houses can participate under this guidelines. The ministries of industry and food and agriculture propose that the programmes of Integrated Rural Development should cover also rural industries, making the BDO responsible for developing cottage and rural industries and monitoring their progress. Whether the industries concerned will be centrally sponsored or taken over by the states, will be decided at the NDC meeting as part of the wider package on Centre-States financial relations. The good industrial growth record for the first six months will have to be kept up if the planned growth rate of 10 per cent for 1978 is to be achieved. In fact the rate for the third and fourth quarters would have to be 15 per cent and it has not been that–the RBI August Bulletin warns. Where a special effort needs to be made is in regard to countering the effect of floods, improving industrial relations, and removing capacity constraints. The fall in railway revenue and the number of wagons loaded should be added to the other declining pointers as in consumer durable–footwear (fall of 39 per cent) rubber foot–wear (13.6 per cent) Sewing machines (32.4 per cent) and storage batteries and electric fans (6 per cent)–on all of which special efforts are called for.

National Production Front:

Steel: In November, the integrated steel plants produced a low 5.41 lakh tonnes of saleable steel (5,000 tonnes below October) and for the 8 months April-November 1978-79 produced 4.26 million tonnes against the target of

5.14 million tonnes and 4.52 million tonnes for April-November 1977-78. What is equally worrisome is that in the balance of 4 months, December-March, when it was expected that the production shortfall of 8.8 lakh tonnes would be made up, there is developing an all round raw materials shortage-of coking coal, limestone, manganese ore, dolomite chips, leading to the blanking of some of the blast furnaces. The raw materials crisis is a result of the non-availability of wagons. The production shortage of the integrated plants is compensated by the performance of the mini-steel plants so that the combined production of saleable steels for the eight months is 5.23 million tonnes. The steel rerolling sector also faces a shortage of billets and rerollable scrap, its basic inputs. They get their billet from Bhilai, Durgapur, IISCO and TISCO from whom they are getting less than 30 per cent of their requirement, so that their maintaining the 1977-78 production of 0.89 million tonnes for the current year is doubtful. The ministry is of the view that the future of the rerolling sector lies in close relation with mini steel plants and their developing capacities to roll various grades of carbon, special and alloy steels. Against this background it can be understood that SAIL has launched a crash import programme comprising orders for 1.31 lakh tonnes valued at Rs. 42 crores, including 75,000 tonnes of structurals, totalling 3.65 lakh tonnes imports during the period April-October 1978. SAIL also reports that it has approved DSP's Rs. 159 crore expansion programme to install a captive plant, a universal beam bill and a new furnace. SAIL is acquiring the IISCO shares held by the state government and public financial institutions, so that with complete SAIL ownership, the plant can be given the massive financial assistance to make it economically viable. Bokaro's expansion from its current 1.7 million tonnes capacity to 4 million tonnes is being undertaken by MECON which has collaboration arrangements with a US and West German firm and the second cold rolling mill and the equipment will be indigenous to the extent of 100 per cent in structurals and 65 per cent in other parts. The total cost will be Rs. 2,000 crores when it is commissioned in March 1980. Coking coal shortage referred to at length in the last issue (see p 12) continued to affect production in all steel plants, TISCO's iron production fell from 1,40,800 tonnes in October to 1,39,800 tonnes in November, ingots from 1,60,600 to 1,52,200 and saleable steel from 1,38,500 tonnes to 1,24,100 tonnes.

Crude: The major event in December was the OPEC announcement that crude price will be raised from $ 12.70 a barrel to $ 13.335 on January 1, 1979, to $ 13.843 on April 1, $ 14.161 in July 1, and $ 14.542 on October 1, representing a 5 per cent increase on January 1, 1979 and a 14.5 per cent rise on October 1 to compensate for the high rate of world inflation and the depreciation of the dollar. A first estimate by the government is that for 1979 the cost of crude import of 16.75 million tonnes will rise by 10 per cent to Rs. 2,034 crores. Government has under consideration a 10 per cent rise in the price of petroleum products and the alternatives suggested in Parliament of a part of the increase being met by reducing the excise duty. In December there was the further problem of the Iranian supply amounting to 1.2 million tonnes for November and December, falling to 2 or 3 lakh tonnes because of the internal disturbances in

Iran and the strike in its oil industry. In addition to the 8,00,000 tonnes additionally from Iraq, during November and December referred to in the last issue (see p 13) further product imports of 1,10,000 tonnes HSD, 90,000 tonnes kerosene and 2,25,000 tonnes of fuel oil have been arranged. For 1979, contracts have been entered for the supply of 4.5 million tonnes from Iraq, 1.5 million tonnes from UAE, 2.5 million tonnes from Saudi Arabia and 1.5 million tonnes from USSR. Also an agreement for the supply of 1.6 million tonnes of petroleum products during 1979 is being concluded with the Soviet Union. Meanwhile intensification of internal drilling has been undertaken. ONGC commenced drilling a well in Gajolia in Tripura which is one of the most promosing structures in the area. The commission has also drawn up a five year plan for oil drilling in Assam and Nagaland to increase recoverable reserves from the present 45 million tonnes to 90 million tonnes by 1982-83. In 1976-77 and 1977-78 it drilled 47 wells in Assam and Nagaland and found oil io 32 of them, while Oil India drilled 31 wells in Assam and Arunachal Pradesh, of which 17 are oil bearing and 2 gas bearing. Also 120 km offshore north west of Bombay, a gas field of significance has been discovered yielding 2,20,000 cubic metres per day in one well with 3 more wells to be tested. The Netherlands has offered supply of a jack up drilling rig to ONGC for oil production at a cost of Rs. 32 crores. In the meanwhile ONGC has under study a French Consultant report that the future production level of Bombay High might decline because of a water break through in the wells. The study is now concentrated on the cause for the decline which could also be due to normal conditions relating to oil pumping and the reservoir conditions in the wells.

Coal: The dewatering of coal mines started in September is being completed by January and as a result production is picking up. In ECL the daily average increased from 54,000 tonnes in October to 70,000 tonnes in December. BCCL and CCL which were not affected by floods increased their production by 9.5 per cent during April-November. As a further consequence, pit head stocks stopped declining and increased by 4 lakh tonnes in November and 2-3 lakh tonnes by mid December. Coal stocks for power houses, cement units, and brick kilns are being assured, according to the government. The ministry is also shifting its investments in the coal sector to creating fresh capacity in place of the greater concentration, about 60 per cent, on existing mines. From now, it will be 40 per cent investment in existing mines, and 60 per cent in new ones. CCL has embarked on a massive programme to increase its coal washing capacity by modernising 4 existing washeries and setting up 3 new ones which have been dovetailed to its increased coal production action, from 24 million tonnes this year to 59 million tonnes in 1987-88. ECL increased its November despatches of soft coke to 0.64 lakh tonnes (up from 0.58 lakh tonnes in October). It also faces the problem of mounting losses, due to low output which is 20,000 tonnes below target. The various factors add upto the need for improved management of the unit. For the country, against the 1978-79 estimated demand of 112 million tonnes and target production of 113 million tonnes, the actual production is likely to be 106 million tonnes, with

CIL which has produced 54.9 million tonnes during April–November, estimated to produce 91–92 million tonnes during the year–10 million tonnes lower than its target. The overall production is expected to be 103 million tonnes for the year. For 1979–80 the CIL target has been fixed at 106 million tonnes, with overall production fixed at 119 million tonnes, which is also the estimated demand for that year.

Iron-ore and Non-ferrous Metals: India and France have established an agreement for improving iron-ore processing and if necessary establish an additional steel mill to use the iron. Aluminium production for the year is expected to increase by 20 per cent to 2.15 lakh tonnes and an additional 45,000 tonnes are to be imported to meet the total demand. In December aluminium price was cut by Rs. 1,360 per tonne and this is to be passed on to the consumers. In copper, production will be 23,500 tonnes and 70,000 to 80,000 tonnes are to be imported to curb speculation and meet total demand. Zinc production will be 67,000 tonnes and 31,000 tonnes will be imported. Lead production will be 23,000 tonnes and imports of 20,000 tonnes are expected to meet the demand of 43,000 tonnes. The Union Cabinet announced in December increase in royalties of all varieties of mangenese ore as a means of covering the cost of units and increasing supply. Except for copper, there has been a steady increase in the production of all non-ferrous metals in the country, but demand has been increasing even faster so that imports have had to be increased. Total non-ferrous metals imports in August were higher at 9,122 tonnes valued at Rs. 10.73 crores (up from 8,998 tonnes and Rs. 7.23 crores in August 1977), though for the period January–August 1978 they were lower at 73,372 tonnes against 90,150 tonnes in the same period in 1977.

Cement: In December, the Union government raised the price of cement by Rs. 39.91 per tonne to help subsidise the production of clinker with the use of furnace oil to enable the industry to pay the additional wages it is required to pay its workers and to subsidise the cost of imported cement. The consumer was thus to pay from December 7 an additional Rs. 2.10 to Rs. 2.25 per bag. As a result of the use of fuel oil, 1.3 million tonnes of cement will be saved between December and March and the government will have to pay Rs. 92.50 per tonne of clinker on account of the use of furnace oil. 12 lakh tonnes of cement have been imported from January 1978 and it is estimated that another 8 lakh tonnes will be imported by March 31, 1979. The Union government also announced at the end of December a package to promote mini cement units establishment—(a) exempting them from distribution control which means a gain of Rs. 30 per tonne, (b) excise duty rebate upto 50 per cent for 5 years, giving them an additional Rs. 32.50 per tonne and (c) all other benefits, incentives and facilities offered by the Union and state government for backward and hilly areas location. It is hoped that the price difference of Rs. 70–80 per tonne in their favour will lead to the setting up of many mini cement units. The Cement Research Institute has identified 46 potential sites in 19 states, including 18 in Tamil Nadu. The government has issued letters of intent to 18 plants. The proved reserves of cement grade limestone are 7,878.60 million tonnes and

further inferred reserves of 51,728 million tonnes, and the Institute has recommended the use of the vertical shaft kiln or the small rotary kiln as the preferred technology. A further advantage in this programme is that the present regional imbalance in the production and consumption of cement (70 per cent produced in the South and West and only 50 per cent consumed there), with the cost of transport from the South to the North being Rs. 140 per tonne, will be corrected by opening a number of mini cement plants in the North and East.

Sugar: Sugar production during the second half of November 1978 was 2.21 lakh tonnes against 1.60 lakh tonnes in the same period in 1977. The total November production was 3.25 lakh tonnes, bringing the first two months total to 3.99 lakh tonnes compared to the previous year's first two months of 2.85 lakh tonnes. The despatches during November was 4.76 lakh tonnes for internal consumption and for the first two months 9.74 lakh tonnes for internal consumption and 2.26 lakh tonnes for export. The closing stock with the factories on November 30, 1978 was 25.17 lakh tonnes compared to 11.26 lakh tonnes on that date in the previous year. The Reserve Bank appreciating the predicament of the industry with mounting stocks, extended the period at that facility instructing commercial banks to sanction clear loans upto Rs. 25 lakhs for off season repairs. The Union government announced the takeover of the management of 2 mills in Uttar Pradesh and notice of takeover to 160 factories, 120 of which had not started crushing when Lok Sabha adopted the Sugar Undertaking Takeover of Management Bill on December 13. At that time, the arrears to cane growers stood at Rs. 46.75 crores. Sugar prices had fallen to Rs. 216-246 per quintal and consumption increased to 9.7 lakh tonnes in October-November 1978 compared to 7.2 lakh tonnes in October/November 1977. The government has also announced that mills can export sugar directly. Against the 1978 quota of 6.05 lakh tonnes, STC has so far exported 4.5 lakh tonnes. The mills need government subsidy to export. They report their cost at Rs. 225 per quintal, the STC purchase price is Rs. 186, the London price is Rs. 165, which after freight and insurance will be Rs. 120, so that their exports are not in their interests, they feel. This raises the whole question of the viability of this industry and points to the need for a review of its cost-output structure and restructuration.

Paper, Electronics and Textiles: In December the Union government decided to import 75,000 tonnes of paper during the current year and a similar amount in 1979-80 to cover the gap between demand and domestic production. Similarly against the domestic production of 55,000 tonnes of newsprint, STC imports 1.5 lakh tonnes, which will continue at a lower rate after the Kerala and Mysore projects become operational in 1981-82 in producing 1.5 lakh tonnes. The government also has under study the takeover of paper distribution in view of the large scale black marketing in the retail trade and the replacing of the middlemen who act as agents of the manufacturers. On the electronics front, the Union government has set up a committee to review the functioning of the department and the Commission which supports the annual production which has increased from Rs. 180 crores

in 1971 to Rs. 300 crores now. IBM has been replaced in the computer area, whose numbers have increased from 110 in 1971 to 300, with 60 put up by ECIL. The choice in the computer area, which is fast developing all over the world, for India is a narrow one and may involve giving turn key contracts to one or other the 3 main multinationals which dominate the production area. On the textiles side, the Union government announced in December its decision to allow the art silk units to spin cotton along with manmade fibres, and to allow them to raise their capacity upto 50,000 spindles as in the case of cotton textiles.

Floods: The National Flood Commission will submit its report on the strategy and national policy for the optimum use of irrigation sources and for flood control measures. Of the 20 million hectares of land affected by floods, as a result of flood control measures taken since 1954 only 8 million hectares are protected. Hence the means, including legislative and financial of extending the system of control and protection are under study by the Commission. Meanwhile the working group on flood control set up by the Union ministry of agriculture has recommended an outlay of Rs. 1,727.12 crores for flood protection schemes—Rs. 1,005 crores for engineering works, Rs. 698.62 crores for water shed management including afforestation and soil conservation, and Rs. 23.5 crores for modernising flood forecasting and warning system and flood plains zoning. This will cover the Indo-Gangetic basin, with its 18 flood prone river basins, extending over 7 states and the Union territory of Delhi and protecting 5.5 million hectares from floods by engineering works and covering 3.36 million hectares with soil conservation and afforestation.

Fertilisers: India is among the important fertiliser consumers in the world, with the fastest rate of increase in consumption for 1977-78 at 37 per cent against a world average of 2.87 per cent. Per hectare consumption is however low at 15.6 kg in 1973-74 compared to 160 kg in Egypt, 404 kg in Japan, 178 kg in France. In 1977-78 Indian consumption rose to 20 kg per hectare but still has a long way to go, given the close relation between yield levels and fertiliser. The Union government, decided in December, despite the Fertiliser Corporation's objection, to hold up further work on the coal based Korba fertiliser plant despite the fact that Rs. 21.04 crores have already spent on its development, the possibility that its total might escalate well beyond Rs. 118 crores to something around Rs. 200 crores, and the machinery which has started arriving. The government decision is based on the fact that it wants to see what the problems faced by the other two coal based units—Talcher and Ramagundem—are, and the commissioning problems and machanical failures involved in coal based technology for fertiliser production, on which there is only one plant—in South Africa-functioning in the world and which is facing some very serious problems.

Agricultural Production: The rabi prospects in the north were affected by diesel and petrol shortage during December, and the samba crop in the south by unseasonal heavy December rains. The latter will be dealt later under the state sector. In Punjab, Haryana and Uttar Pradesh acute diesel shortage and delay in the lifting of the paddy

offered in the mandis are reported to have affected rabi sowing. The government policy of announcing support prices at the sowing season, (see last issue pp. 19 & 20) has been widely welcomed, though the pressure for raising the support price of wheat from Rs. 112.50 to Rs. 130 and for gram from Rs 125 to Rs. 150 per quintal is also kept up. Foodgrains production in Uttar Pradesh increased by 33 per cent from 1973-74 to 1977-78 when population increased by 7.4 per cent, and yet foodgrain prices instead of falling rose by over 5 per cent, which indicates either faulty statistical collection or widespread foodgrains hoarding, probably a combination of two. The Cabinet subcommittee which is considering pricing and procurement for rabi cereals has also been asked to suggest ways of helping the sugar and khandasari units. APC has recommended a support price of Rs. 245 a quintal for mustard for the current rabi crop, which is Rs. 20 more than the current price, and has suggested that the minimum price of other oil seeds belonging to the mustard—rape seed group be fixed on the basis of their normal price differential with mustard. The Union government published in December its final estimates of 1977-78 food crops--Rice 52,674,000 tonnes, jowar 11,818,000 tonnes, bajra 4,710,000 tonnes, maize 5,946,000 tonnes ragi 2,983,000 tonnes, small millets 2,113,000 tonnes, wheat 31,327,000 tonnes, barley 2,309,000 tonnes, gram 5,451,000 tonnes tur 18,877,000 tonnes other kharif and rabi pulses 4,459,200 tonnes-total 125,604,500 tonnes, which is a 13 per cent increase. Cash crop—oil seeds, fibres and other crops—also record an increase ranging from a small 1 8 per cent in tapioca to 64.6 per cent in cardomom and 43.6 per cent in castor seed. This is reflected in their falling prices, - 4.9 per cent in raw cotton, -7.4 per cent in raw jute and -10.0 per cent in oil seeds between November 19, 1977 and November 18, 1978. Hence minimum support prices are being established for cash crops also.

Exports: Parallel to the declining export performance during the first 6 months, April-September 1978-79, at Rs. 2,497.36 crores analysed in the last issue (see p 21), the import figures released by the government show an increase of 25 per cent during that six months at Rs. 3,085 crores compared to Rs. 2,476 crores in the first six months of 1977-78. The April-October exports are Rs. 2,970.7 crores and imports Rs. 3,612 crores, compared to the imports of Rs. 3,155.86 crores in April-October 1977-78. The liberalisation of import policy also referred in the past two issues and inflation in industrialised countries account for this steep import increase. The trade deficit thus stands at Rs. 588 crores during the first 6 months and could pass Rs. 1,000 crores by the end of the year. The main thrust should be to export effort. In December, the government decided to allow export of 75,000 tonnes of onions and 25,000 tonnes of potatoes on the basis of the recommendations of the task force set up by commerce ministry. Referring to the export of Rs. 1,600 crores of agricultural product per annum at the end of the Fifth Plan, it states that this could be raised to Rs. 3,200 crores at the end of the Sixth Plan, along with a diversification of exported products to include cereals (on which an export target of 1 per cent of annual production or 1.25 million tonnes is suggested), Rive animals and meat products (in 1977-78 upto February 1978 Rs. 870 crores were exported), fruit and vegetables and marine products, unlike the current

concentration on prawns, edible nuts, sugar, tea, coffee, pepper, groundnut extraction and tobacco. This would involve, according to the task force, freight subsidy for products to be marketed to far away places, liberal and duty free imports of plant and machinery for processed food manufacture for exports. In December contracts for the exports of 6,000 tonnes of meat and 3,000 tonnes of tea to west Asia were concluded. Garment exports for the current year are estimated at Rs. 300 crores (up from Rs. 250 crores in 1977) and for 1979 a target of Rs. 400 crores has been established. Handloom exports, unlike earlier pessimistic predictions, increased by 20 per cent during April–September 1978-79 at Rs. 123.98 crores against the year's target of Rs. 274 crores, and the 1977–78 first six months earning of Rs. 103.28 crores. The Indo-Soviet annual trade protocal signed in December envisages an increase of 20 per cent in 1979 from Rs. 1,000 crores in 1978 to Rs. 1,200 crores in 1979. GDR has ordered a number of products from the small scale sector such as shoe uppers, handlooms, textiles and handicrafts. Similarly Indo-Iraq trade is planned to double from Rs. 80 crores to Rs. 160 crores in 1979. Also a scheme for the direct conversion of sugarcane into alcohol for export is under study, along with the long standing project for an Export-Import Bank. A decline in tobacco exports from 55 million kg in January–June 1977 to 47.7 million kg in January–June 1978 is reported, along with a build up of 30 million kg of virginia flue cured tobacco as a result of surplus output in 1977, and the total estimated at 175 million kg at the end 1978. Soviet tobacco imports are declining from a normal 22–23 million kg to 14 million kg in 1977-78, and Brazil's emergence as the second largest tobacco exporter replacing India has to be faced in opening up new markets in West Germany and Japan. One problem faced in planning the country's export import policy and programme is the avoidable time lag in the availability of foreign trade data (in this February 1979 issue, the overall totals are available only upto October 1978, and the detailed break down only upto September, the printed 1977–78 figures and selected items only for April–June). The staff of the directorate general of commercial intelligence and statistics needs to be strengthened and the computer facilities expanded and fully used to overcome this problem.

Aid : Negotiations with the World Bank for a credit of Rs. 125 crores to finance the Rs. 295 crores gas based fertiliser plant of the Indian Farmers Fertiliser Cooperative at Surat, a credit of Rs. 100 crores for rural electrification covering 13 states including Tamil Nadu and a third credit of Rs. 200 crores to the National Thermal Power Corporation for the Ramagundem super thermal station have been completed during December. Japan's Ishikawayima Harima Heavy Industries has proposed a joint sector project with Tamil Nadu government to fabricate parts for offshore drilling rigs, heavy duty cranes and sophisticated port machinery. India and Norway signed an agreement in December for Rs. 4.5 crores fertiliser aid to India.

International :

Bangladesh: The Sixteenth meeting of the Indo - Bangladesh joint river commission referred in the last issue (p 23), also decided to set up a joint committee for working out an

agreement on the sharing of Teesta waters after examing the availability and requirement of each country. It also agreed on a system of joint inspection of the rivers on the borders of Bangladesh – Assam – Bangladesh – Tripura and Bangladesh – West Bengal.

Pakistan: The imbalance in Indo-Pakistan trade is being gradually corrected. In 1978 it is estimated that India's exports to Pakistan will be Rs. 48 crores and Pakistan's exports to India Rs. 34 crores. India has offered to enlarge its imports from Pakistan and is adding certain chemicals and gypsum to its import list. On the other hand it has also agreed to peg exports of Indian engineering products, particularly agricultural machinery and implements, scooters and related products.

China: Further to the report on the slowly developing India-China trade, in December an agreement was reached under which India will import 800 tonnes of paraffin wax from China. The sale price of Chinese wax at Calcutta will range between Rs. 6,212 to Rs. 6,530 per tonne. Also STC is negotiating with China for the export and sale of sugar to expand the Indian sugar acquired by China through third world countries

World Monetary Reform: In the December auction, IMF sold 4,90,000 ounces of gold at $ 195.51 to $ 196.75 an ounce, which was much lower than the November price of $ 224.02 per ounce. The special trust fund was credited with $ 74.2 million as sale proceeds from this auction, raising the fund total to $ 2.04 billion.

UNIDO and UNCTAD Appropriate Technology and NIEO seminars: At the December UNIDO seminar in Anand, Gujarat, in December attended by 29 developing countries, it was agreed that with the right selection and development of technology, the developing countries can achieve the Lima target of 25 per cent of world industrial production by 2000 AD. In this context the concept of appropriate technology was defined as the technology mix contributing most to the economic, social and environmental objectives, in relation to resource endowments and conditions applicable to each country. The technological choice should be related to the objective to provide adequate employment opportunities and meeting the basic socio-economic needs of the poorer sections of society. It also reaffirmed the conclusions of the TCDC conference in Argentina (see Vol VIII pp 588-589) to improve communication of technological information among developing countries and exchanges of processes and techniques including joint ventures among themselves. A seminar on UNCTAD V and NIEO also in December in Delhi emphasised the need for greater intra third world trade, expanding exports of manufactures and semi manufactures, reclassification of tariff structures by adding new items and guarantees against imposition of the anti dumping code, the need for easy terms and conditions for the purchase of new ships to correct the serious imbalances in the world distribution of shipping tonnage, equitable distribution of world liquidity, increased financial flows to the poor countries and cancellation of debts of poor countries as a means of moving towards NIEO.

Colombo Plan: The Colombo Plan meeting in Washington in December emphasised the need for the developing member countries concentrating on

growth with social justice, meeting the basic needs of their people and the need for enhanced external assistance on soft terms, particularly a substantial real increase in the IDA replenishment, improvements in the untying of aid and local cost financing and less protectionism to increase international trade. There was a feeling that the Colombo Plan was not meeting the development needs of its member countries, that it was engaged in a lot of talk such as its final communique summarised above shows, and that its widening its mandate from technical assistance and capital aid to all the problems of the NIEO may be the reason. Hence it was decided to cancel the 1979 meeting and in place to conduct an enquiry among its member countries to see what should be its function. This will be examined at a high level meeting in 1980.

World Food: The USDA forecasts an exportable wheat surplus of 10 million tonnes from Australia, 2 million exports of barley, 35,000 tonnes of rice and 40,000 tonnes of maize. Wheat sales are estimated at 5,00,000 tonnes to USSR, 2.5 million tonnes to China, 1 million tonnes to Japan, 2.9 million tonnes to Egypt and the middle East and 1.3 million tonnes to South East Asia.

World Coffee: World coffee exports are estimated at 52.31 million and 56.31 million bags (60 kg each) in 1978–79 with a total world production at 69.79 —73.79 million bags. Brazil will export 9.13 million bags, Colombo 8.80 million bags, Cameroon 1.64 million, Coata Rica 1.21 million, El Salvador 1.95 million, Ethiopia 1.27 million, Gautamala 2.04 million, India 1 million, Ivory Coast 4.02 million, Kenya 1.12 million, Mexico 2.40 million, Uganda 2.30 million and Zaire 1.01 million bags. All countries are exporting more except India which in 1977–78 exported 1.08 million bags.

World Steel and Timber: World steel consumption for 1978 is estimated at 715 million tonnes and for 1979 at 735 million tonnes, world demand growing by 1.9 per cent for 1979—mainly as a result of increased production and demand needs of smaller countries and developing nations. The change over from determination of steel production trends by the big users—Europe, US and Japan—, to the developing nations is highlighted in a UNIDO report. Between 1978 and 1985 the developing nations will be installing 120 million tonnes of new steel making plants—which is more than EEC's total steel capacity. To this should be added 30 million tonnes by China. The half way house, creation of plants by the developed countries to make semi finished steel in developing countries with ore deposits, has been set aside and in place the countries concerned are rapidly building their steel plants. Forecasting an annual 12 per cent increase in steel making capacity over the next 10 years, the UNIDO report proposes arrangements for cooperation between industrialised and developing countries in the iron ore export-import market and the better use of the under exploitated deposits of coking coal. World demand for timber and timber products is on the increase despite growing use of plastics. Hence the importance of forests not only for its protective function regarding ecology, soil and water but also for its product. FAO reports that in 1975 imports of forest products were over $ 28.7 billion and exports $ 26.1 billion, India's share being $ 82 billion and $ 24 billion respectively.

World Rubber Agreement: The four weeks discussions among leading rubber producer and user nations which concluded in early December in Geneva failed to produce an international agreement. Despite the fact that four countries—Malaysia, Indonesia, Thailand and Sri Lanka account for 90 per cent of world exports and four countries—US, Japan, USSR and EEC account for 70 per cent of their import, the preparation for this meeting made over a 2 year period, and the background of the rising cost of synthetic rubber, the meeting could not agree on the two main issues–the size of the buffer stock–the producing countries wanted 4,00,000 tonnes and the US wanted 7,00,000 tonnes–and the price range, where again the US would not accept the producers proposals. The conference is scheduled to meet again in March end and unless it comes to an agreement, UNCTAD will be meeting without any agreement on any of the commodities under its Integrated Commodities Programme (see Vol VI pp 318, 380 and 504).

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II Agricultural Production

Paddy:

At the end of the month, because of the heavy rains during the last week of the month, the government reports that in Thanjavur district, 36,480 acres of thaladi, 27,545 acres of samba in ears and 83,950 acres of samba lodged were submerged. The extent of the damage to the paddy crop can be computed only after the rains stop (for the eighth day it was continuing) at the rate of 9 - 10 cm a day, Madras receiving in 4 days 50 per cent of the total rainfall in the 3 months of the North East monsoon, and the water is drained from the field. There is no doubt that there will be some considerable damage to paddy crop. The government extended the date of December 15 to December 31 for the movement of paddy from Thanjavur district to other states without the payment of levy to help the farmers, as the government with over 6 to 10 months stocks was not in a position to buy all the paddy available for sale. As a further relief to farmers, the government agreed that there will be no destraint or auction proceedings against agriculturalists for 2 months for recovery of short term and medium term loans, amounting now to a total of Rs. 130 crores.

Research Results:

Research at the Tamil Nadu Agricultural University has resulted in formulating a number of low cost high yielding techniques which have been

made available to farmers.' To grow more paddy at lower cost, use of (a) enriched disease resistance super seedlings, which are produced from seeds soaked for a night in a nutrient solution and dipping the sprouted seeds in fungicide, with phosphate and urea added: (b) blue green algae leading to higher yields because of nitrogen fixation: (c) fertilisers and insecticides such as zinc sulphate in alkaline and neutral soils and nitrogen; and (d) special *pai* nurseries which raise seedlings in a polythene sheet and so save space and water which have been widely diffused among farmers. One of these methods, the dipping of the roots at seedling stage in insecticides, has been experimented with at the Aduthurai station where of 17 chemicals tried, Oftanal and Dursban gave the best results. Experiment with growing pulses as a wet crop on paddy bunds in Chingleput district opens up the possibility of growing black or green gram on the bunds of the paddy field, which also insures them against excessive water from the field or the irrigation channel, while providing them with enough moisture for its speedy growth. A similar experiment is being tried in the July-August paddy crop with growing sugarcane on the bunds in Tiruchirapalli district. Another related research concerns the strengthening of paddy straw as cattle fodder in the proteins, vitamins and minerals, it is lacking in. This involves either use of molasses and urea to fortify paddy straw or storing the straw with a leguminous fodder, cow pea, sannhemp or berseem in alterate layers of the legume fodder and paddy straw. Research has also been directed at the lack of success of summer cotton (Cambodia) cultivation in South Arcot. Unlike in Ramanathapuram district, the South Arcot crop suffers from contabescence and poor filling of seed and while it can be switched to winter to escape these defects, in winter South Arcot grows the more profitable sugarcane crop. Hence research is now concentrated on developing a short duration cotton variety for summer growing in South Arcot. Another research area is the increase in the nutritive value of amaranthus leaves as a very cheap vegetable. The Mysore Institute experiment has shown that the raw amaranth seed protein has a protein efficiency ratio equal to that of calsin. Research in its improvement by breeding of different cultivable varients is underway. A boost to research will be the January International Symposium on Agricultural Research on the occasion of the Golden Jubilee of ICAR when a programme of lab to land is to be developed covering 50,000 families. Also each block out of 2,300 chosen will get an additional Rs. 5 lakhs to provide gainful occupation resulting from the new research results to some 520 families. The research results will also be monitored.

Jute:

The Tamil Nadu Agricultural University's working group on Jute cultivation in peninsular India at Coimbatore in December emphasised the need for research in the production of hybrid varieties of jute seed suited to Tamil Nadu, the growing and processing of jute and appropriate methods of jute cultivation. Research at the university has demonstrated that jute can be grown in the state as a short term crop with a duration of 110-115 days, with the possibility of sugar mills growing jute during certain specific seasons. A further

question on which research is to be concentrated is whether farmers can grow jute wheat and rice regularly in order to increase the returns from their lands.

Dairy Farming :

The state government under Operation Flood II wherein it receives a loan of Rs. 40 crores, plans to organise 5,000 additional milk producers' cooperatives to benefit 10 lakh familes. A cattle feed factory is to be set up at Ennore and the problem of pricing the feed low enough as in Gujarat is under study by the government. Government land in villages is to be assigned to cooperatives to raise fodder grass. Heifer production centres to improve cattle breeds are to be established. Compared to the other districts like Coimbatore and Salem, the Chingleput district which supplies 1 lakh litres of milk to Madras city out of its daily consumption of 8 lakh litres, is not doing well with only 20,000 litres being purchased by the department directly from the producers, and 500 milk societies being closed. One, perhaps the major, reason is the cost of cattle feed in Chingleput where farmers have not realised the advantage of growing fodder—even from the point of view of returns. While sugarcane yields Rs. 1,500 per acre, grass, sold at 5 paise per kilo, fetches a profit of Rs. 2,000 at an estimated production of 100 tonnes per acre. If grass was raised over 10,000 acres in the district, dairy farming will become prosperous. The Tamil Nadu Dairy Development Corporation announced in December the setting up a milk chilling plant at Agasipalli village in Krishnagiri taluk of Dharmapuri district. The 15 hectare site for the project is also to be utilised for establishing a plant to produce milk powder and for setting up a dairy.

Fish Farming :

The state government, in cooperation with FAO, is launching on a 2 year Rs. 1 crores small scale fisheries project in the Thanjavur district. The project is to demonstrate the feasibility of small scale fishery programmes run on scientific lines. 3,400 catamarans and vallams are to be motirised with a subsidy of 50 per cent on engines, and 500 vallams are to be fitted with in board engines at the same rate of subsidy. 2,000 country crafts are to be replaced by fibre glass boats, on which a subsidy of 33.33 per cent is to be given as well as a subsidy on nylon gear. 3,300 insulated boxes are to be distributed to small fishermen to enable them to bring in their catch in prime condition. Rs. 200 lakhs are to be spent on laying link roads for transporting fish to the marketing centres. Compared to the introduction of 2,200 mechanised boats over the last 3 decades, as at 1977 there were 42,000 traditional crafts, showing an increase of 13,500 in 5 years and hence the need to develop both mechanised and small sectors harmoniously. Aqua culture studies in the state have emphasised the commercial value of culturing tiger prawns and white prawns. There has been a break through in lobster culture, enabling the culture of shorter duration lobster farming. The experimental lobster farming at the Kovalam Field Research Centre, near Madras shows that warm coastal waters enables comprehensive growth of baby lobsters in about 18 months instead of the traditional 3½ years. This will help small scale fisheries and coastal aqua culture to develop shorter duration lobster farms and use low cost techniques for enlarging the produce of mussel culture. The coastal waters off Tirunelveli have also been found to be conducive to the growth of

lobsters. Kerala is pioneering a modernisation scheme which is of interest to this state, under which country craft are moved to and from fishing grounds by mother vessels. This intermediate technology benefits small fishermen, who are encouraged to use small purse-seine boats. The increase in Tamil Nadu and southern states fish production is important, as there is an all India 5 per cent (34,000 tonnes) decline in fish production in 1977-78.

Tea:

Tea production for the year will not reach its targetted 600 million kg because of the lower northern tea production due to drought, hailstroms and floods. In the first six months, April-September 1978-1979, production was 268 million kg compared to 276 million kg in the comparable 6 months in 1977-78. The fall in exports during the period, April—October 1978-79, was even steeper at 40 per cent in volume (79 million kg compared to 121 million kg in the previous year) and 50 per cent in value (Rs. 160 crores vrs Rs. 358 crores in the previous year). This means that the export ceiling of 200 million kg will not be reached, and exports are likely to be between 170-180 million kg, with value at Rs. 360 crores-in 1977-78 it was 222 million and Rs. 556 crores. More serious is the question whether some of the export markets lost this year can be recaptured in the next season, on which there needs to be some study and action in expanding packet tea sales. Internally, as there has been a fall in demand for ordinary varieties of tea, and there is the 40 million kg surplus as a result of the fall in exports, the cash flow position of small tea producers has become difficult.

Further to some of the recommendations of the tea Marketing (Tandon) Committee set up by the Union government summarised in the last issue (see pp 30-31) its other recommendations are (a) setting up a finance body to meet tea industry needs, (b) creation of an apex fund and an apex body to coordinate research, (c) abolition of excise duty on packet tea, (d) opening of more cooperative factories to protect the interest of small growers, (e) appointment of a special taskforce of economists to prepare a blue print of the industry's future needs and financial requirements, (f) leaving domestic marketing to the choice of producers and buyers with the Tea Board monitoring the markets, and (g) a special study of small growers by the Tea Board to be updated every 3 to 5 years and the setting up of separate cells by the Tea Associations of North and South India to laise with the Tea Board on small growers' problems. The Union government will soon decide about grant of soft loans to new tea plantations in non-traditional areas in order to attain the Union government target of bringing 8,000 hectares of new area under tea every year, and reaching a production target of 1,300 million kgs by the end of the century. It has also issued a notification in early December abolishing the stock limit on tea (1,000 kg) as it serves no purpose.

Rubber:

Rubber production in South India in the five months, April-August 1978-79, declined by 19,000 tonnes, to 40,391 tonnes, while consumption was 65,629 tonnes. Rubber stocks declined at the end of August to its low level at 18,766 tonnes (compared to 30,000 tonnes in

August 1977), and price shot up from Rs. 739 a quintal in April 1978 to Rs. 1,246 in September, while in Malaysia it was Rs. 887 and London Rs. 937. The Union government therefore decided in mid December to import an additional 15,000 tonnes, making total imports 30,000 tonnes.

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III Industrial Development

Salem and Steel Supply:

In December, a Rs. 25 crores contract was signed for the supply of two continuous annealing and pickling lines for stainless steel strips for the Salem steel plant. It will heat 70,000 tonnes of finished stainless stell strips per annum and will be commissioned by early 1981. On the steel supply side, as the annual quota for the state for 1978-79 has been fixed at 12,300 tonnes as against the normal requirement of 40,000 to 50,000 tonnes, the state government is on the one hand making representations to the Union government to increase the allotment by making an ad hoc allocation of scarce steel materials and on the other hand has introduced a rationalised system of steel distribution. Under the scheme, the demands of the industrial units will be met on the basis of past experience, orders on hand, machine capacity and the number of workers employed. It has also set up an Advisory Committee to SIDCO to help in the distribution of essential iron and steel items to small units. The committee comprises representatives of Hindustan Steel, the regional office of the iron and steel Controller and private firms in the major consuming centres in the state. SIDCO has completed a survey of the 20,000 small units in the state and identified 3,000 engineering units eligible for scarce steel items, while weeding out 100 bogus units.

Neyveli:

Work on the second mine and matching power station is under way with collaboration from a number of countries, particularly West Germany. The second mine is adopting the same open cast mining technology as the first mine, involving an outlay of Rs. 145 crores. Its detailed project report will be ready in early 1979, tenders called in October will be opened in January 1979, orders placed in June and civil construction begun in November 1979. The power house consisting of 3 units of 210 MW each is scheduled with land to be taken over in July 1979, order for equipment to be placed so that it arrives in October 1982, when the second mine will be yielding. For this Rs. 215 crore power project, Tata Consultants will prepare the

detailed project report, with its consultancy lasting over 5 years. With the mine being expanded to 8 million tonnes capacity, the power stations capacity will be doubled to 1260 MW. This lignite based power, the only one in the country, will be 8 to 10 per cent cheaper than coal based power (Neyveli provides TNEB power at 16.5 paise per KWH compared to Ennore's 22 paise). The tenth annual power survey showed a Southern power deficit of 5,200 MU in energy needs and 1,270 MW in installed capacity, Tamil Nadu's deficit being 4,000 MU and 900 MW, and hence the need to further develop this unique energy source–lignite–with its 2,000 million tonnes spread over 250 sq kms in South Arcot.

Magnesite and Cement :

The State government has not renewed the lease of the Salem Magnesite company as it has decided to take over and operate itself the magnesite ores in the district. The 3,000 workers are temporarily out of work and so the government company which is being formed is expected to start operations in January 1, 1979. The State government has also decided to set up two cement plants at Tiruchirapalli and Salem where raw material for cement is available. In addition the Union government will start a cement factory near Madras, using imported clinkers. The state plants will enable the government to develop cement concretising of highway, which is both more economical than bitumen surfacing which has a high recurring expenditure as well as a larger, 25 to 30 years, life.

Madras Refinery :

Madras Refinery operations have had to be rescheduled and regulated in accordance with the crude arrivals from various sources, following the fall in crude arrivals from Iran. The shut down of the plant has been avoided with the help of crude from Iraq and UAE. The use of difference grades has resulted however, in a change in the pattern of production, with the yield from middle distillates, that is, kerosene and HSD and LSD, being higher than lighter fraction, of petroleum, gas and naphtha. The reduced production of LPG has affected consumers supply and increased kerosene use. It is expected that with increased crude arrivals in late December and January, production at the plant can be stabilised at a high level.

TIIC and SBI

Under the IDBI scheme of special Refinance facility to help immediate rehabilitation of industrial units affected by floods, TIIC has launched a loan programme to assist village and cottage industries, small scale and medium industries affected by recent floods. Units with assets not exceeding Rs. 100 lakhs are eligible to receive Rs. 25 lakh loans, tiny units in towns with less than 50,000 population are eligible for loans upto Rs. 1 lakh and village and cottage industries Rs. 10,000. TIIC is ensuring that along with the granting of initial moratorium, repayment schedules are realistic and not limited to the traditional 7 years. Units which have received loans earlier are eligible for further assistance. The usual norms of margins, promotors contribution and debt equity ratio will not apply to this scheme. Loans upto Rs. 2,500 will be refinanced by IDBI at a nominal service charge of 1 per cent, loans exceeding Rs. 25,000 will be refinanced at the concessional rate of 6 per cent. The industries, small, tiny and medium, will be rapidly rehabilitated under this sound programme

of aid. The State Bank of India launched in December in Vellore its programme for helping entrepreneurs to start industries from scratch. The first phase of the 4 week programme for 30 entrepreneurs is devoted to achievement motivation training, in the second phase work in small scale industries is organised to enable them understand the various aspects of industrial operation, in the third phase they are trained to prepare project reports and organise resources to set up an industry and in the fourth phase SBI provides them with finance under the liberalised and equity fund schemes. A committee of government officials and small scale industrialists supervises the programme and the SBI coordinates the activities of government institutions so that the needed infrastructural facilities are provided. A consultancy cell in SBI provides continuing assistance and counselling to the entrepreneurs and assists them in preparing project reports, feasibility studies etc.

DIC and Tiny Industry:

The State government, as part of its programme to set up 900 tiny industrial units with the necessary infrastructures, is establishing six more District Industrial Centres to support these industries in the districts of Coimbatore, Nilgiris, Madurai, North Arcot, Thanjavur and Tiruchirapalli in addition to the eight DICs already functioning in Chingleput, Dharmapuri, Salem, Ramanathapuram, Tirunelveli, Pudukottai, Kanyakumari and South Arcot in which 400 units have been located. Over 900 sheds have been allotted to the DICs for outright sale to entrepreneurs each of which costs Rs. 7,500. SBI finances this purchase, the entrepreneurs paying 5 per cent of the cost, 15 per cent of the cost is given as subsidy and the balance is a low interest loan. With the infrastructure provided by DICs, a small industry can now be started with Rs. 10,000 instead of the normal Rs. 20,000. The government has redefined the functional responsibilities of DICs to make them concentrate on cottage and tiny industrial units and small business. Also procedural formalities have been reduced so that units having electric motors upto 5 HP can be issued licenses directly without referring to various government agencies. Other issues needing attention are measures permitting expansion and diversification of successful small units, valuing assets at current value, the subsidy by the Union of the cost of rehabilitating small sick units and the provision of funds to SIDCO and other agencies for running training programmes for small entrepreneurs.

PTC, workshop and Patent Information Unit :

The PTC workshop at Kancheepuram is setting up a Rs. 25 lakh unit for the manufacture of road springs for all nationalised transport corporations. The Workshop which builds 5 coaches a month is also setting up a Rs. 5 lakh tyre retreading unit to retread 800 tyres a month, and so save Rs. 20-30 per tyre. A Rs. 6 crore Patent Information Centre is to be started by Union government with a central library micro film facilities. The centre will provide patents information to the regional centre in Madras and act as a liaison between inventors and commercial bodies. Most of the registration at the Madras office relates to the inventions of South Indians, which calls for closer coordination between the officials and practitioners.

Sugar and TI cycles

Except for two, the sugar mills in the state started crushing in December and expect to exceed the 1977-78 output of 4.90 lakh tonnes. They had arranged for farmers to grow cane for 5.37 lakh tonnes of sugar and despite their financial problems, their contracts with the farmers will be honoured. Two mills are sick and the government may have to take them over. The mills have appealed to government to exempt them from cane cess and purchase tax, as it granted by the Uttar Pradesh government. The question of the loss of Rs. 200 crores by the mill in this state and similar sums in other states on the removal of controls and the operation of a free market raises serious issues as noted earlier, as to the viability of this industry both nationally and internationally. TI cycles reports that in its first month of reopening, November, the workers have crossed the target of 1.25 cycles per man day and achieved 1.26 cycles of production. The worker on this basis earns Rs. 6 additionally and Rs. 30-40 under the group incentive scheme.

Handloom:

SITRA in a report on handloom commissioned by the Union government referred to the need for statewise technical cells on handlooms attached to the Directorate of handlooms to ensure technology transfer and implementation aid to handloom weavers in producing new varieties, increasing productivity, improving quality and reducing costs. The over all loom efficiency is a low 30 per cent which is due to machanical, organisation and social causes, all of which can be corrected as set forth in the report. There can be reduction in yarn waste by care during dyeing and proper training. Savings can also be effected by using tamarind powder instead of rice starch and supply of yarn in the form of double hand plain, single tie in counts 80s and above and 4.5 kg packages in counts 60s and above. The report urges standardisation of specifications of fabric width, reed and pick for each sort and incentives to promote diversification which is costly.

Leather:

The Union government issued a directive in December requiring all manufactures of semifinished leather who had been authorised to convert to finished leather by the 1973 liberalised scheme (Vol III p 806) to get their licenses endorsed by 1979 September. This directive also allows manufactures who have not yet done so to instal finished leather capacity before 1979 September and get their licenses. Meanwhile the Leather Export Promotion Council points out that with the further cut in the export quota for semi-finished leather, —31 per cent for skins and 17 per cent for hides—, several small and medium tanners who have not changed over to finished leather production would have to close down as have 100 in this state in the last decade. The government should look again at the leather export policy recommended by the task force and the cuts proposed, but the move in the direction of value added leather exports is the direction in which they must move.

Private Sector Reports:

Binny's annual report for the year ending 30 June 1978 shows improved performance of the textile division,

progress in the rationalisation in the B & C mills and the modernisation of the textile units at aggregate cost of Rs. 17 crores, of which Rs. 10 crores is from term lending institutions. The Annual report of Kothari (Madras) from 1977-78 shows continued growth in turnover (Rs. 3,142.11) lakhs being an increase of Rs. 180.06 lakhs over the previous year) and profits before tax (Rs. 306.26 lakhs against Rs. 315.86 lakhs). Tea production increased from 18 lakh kg in 1970 to 28 lakh kg in 1978, coffee estates have been replanted to the extent of 50 per cent, textiles turnover increased and Rs. 217 lakhs spent on its modernisation, and similar improved performance by the fertiliser and caustic soda units are reported.

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IV Education, Science and Health

Educational Unrest :

Educational Institutions in Bihar in a continuous state of upheaval and unrest during all of December over the job reservation issue, a one day state wide agitation for job reservation etc. in Assam colleges, agitation in the university and colleges in the Jammu region over political demands and unrest in Pantnagar varsity over student differences, student agitation over college fees in Nellore district leading to closure of all colleges, and closure of the Andhra University and colleges for a few days over the death of two students in a bus accident are reported in December.

Adult and Audio Visual Education

The state government is planning setting up a literacy wing in the Directorate of workers' education to organise literacy programmes for workers in the public and private sectors. To finance this programme funds from the labour welfare fund will in part be employed. The government is also examining a proposal to permit workers to appear privately for the 8th standard examination, so that they can qualify for jobs requiring that educational level. The government also announced that the Union government had sanctioned a Rs. 10 lakh closed circuit television scheme for the Directorate of School Education. 300 schools have TV sets, so that audio visual programmes recorded at the Directorate will be sent to the schools for viewing.

Technical Education

The Council of IITs had decided to allow the use of regional languages for the joint entrance examinations for admission to the 5 IITs, on the basis of the recommendation of a committee headed

by Professor Satish Chandra. The Committee has recommended that objective type questions in simple english should be set and answered in any language and comprehension test in english should be replaced by a test to examine the candidate's knowledge of simple functional english. The all India Board of Technical Education meeting in December in Madras approved a diploma course in precision mechanics, a revised curriculum for the the foremen/supervisor course, and the integration of productivity and management techniques in the technician level courses. It also decided to set up an expert group to review the implementation of the recommendation on recognising polytechnic education made during the last 10 years. TTTI, Adyar from 1979-80 will run polytechnic teachers training programmes in the polytechnics and the schedule to be followed has now been sent to the colleges. This might help over come resistance from the principals and others to the use of innovative techniques and teaching methods learnet in such courses. The state government has informed the Union that it has sat up a committee of medical educationists to chalk out a programme of transition from english to regional language as a medium of instruction in medical colleges. The first group of students to the first full degree course in Ayurvedic Medicine—Bachelor of Ayurvedic Medicine and Surgery—will be starting their study from July 1979 at the upgraded Venkataramana Ayurveda College, Madras. Till now the college has trained for a diploma course and the new university course follows the All India pattern recommended by the Central Council of Indian Medicine.

Science

A technology policy statement drafted by the National Committee of Science and Technology is under review by the Union Cabinet and is expected to result in important policy guidance. Similarly a review of electronic policy is underway as noted earlier. IIT, Delhi announced that it has developed an efficient solar cell that converts sunlight into electricity. It also said to be 100 times cheaper than cells made of imported silicon. Agricultural research is to be strengthened and diversified in the current plan with a net work of separate research institutes for crop, animal science, agro climatology, and post harvest technology, announced ICAR. Also the National Bureau of Animal and Fish Genetic Resources would be part of the well planned ecological, technological and social security effort. ICAR also announced that it is setting up 10 research centres to work on oil seeds. Those at Gwalior, Bhubaneswar and Anantnag will concentrate on rape seed and mustard, those at Dharwar, Kolar and Rupar on groundnut, those at Rewa on Sesamum and those at Akola and Jabalpur on linseed. A National Research Centre at Junagarh on groundnut and the strengthening of 18 of the existing 53 centres of oil seed research are part of this effort. The state government has sanctioned the construction of a Rs. 22 lakh test track at the high way Research Station at Guindy to test different tyres of road to a length of half a kilometre and seven metres wide. Also a test vehicle at a cost of Rs. 7 lakhs is to be fabricated to test old bridges to decide their load carrying capacity. A Regional Centre of the National Institute of Oceanography has been sanctioned for Madras and is to be established soon. DST in

collaboration with INSDOC has opened an information centre at the CSIR complex, Adyar to cater to the needs of scientists and technologists in the southern region. The centre has been functioning from mid December.

Health

The Institute for Research Reproduction, Bombay announced that the ideal male contraceptive, inhibin, a protein that selectively suppresses the follicle stimulating hormones, which has been separated from human seminal plasma, is a pointer of important progress in contraceptive technology and use. The Union government has once more reminded state governments about the importance of observing January 1979 as the family planning month (the Union government has now officially returned to the term family planning), and bring to the attention of all eligible couples the full range of available contraceptive facilities, while also making known the large maternal and child welfare services available. A research oriented comprehensive eye care project has been launched in the villages around Madras. An eye bank is a part of the project which consists of six clusters of ten villages each, each village being covered once a week, with services provided at the villager's door steps and treatment in Madras for necessary cases.

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V Employment

Data on the state of unemployment and employment are still inadequate. The Employment Exchanges show that the total number of job-seekers increased from 102.39 lakhs at the end of March 1977 to 122.27 lakhs at September 30 1978 (an increase of 19.4 per cent). During the period 6.92 lakh job seekers were placed by the Exchanges in employment and between April 1, 1977 and December 31, 1977, employment in the organised non-agricultural sector increased from 207.4 lakhs to 210.9 lakhs. The Union ministry of food and agriculture estimates that in 1978-79 the food for work scheme will help to generate 40 crore mandays of employment, with the 1 million tonnes of wheat and 2 lakh tonnes of rice-in sustaining road construction and repairs, minor irrigation projects, flood control schemes, construction and repair of primary school buildings, as well as desilting operations requested by WB and repair of houses affected by floods requested by several state governments. Kerala is using the scheme to issue construction contracts to voluntary committees of beneficiaries under which 30 per cent of the investment cost is met by food stocks, 60 per

cent by cash aid and 10 per cent by contributions from beneficiaries. During 1977-78 the Union ministry estimates 4.5 crores mandays of employment were created in the 12 states which participated in the scheme during which 2.05 lakh tonnes of wheat and 1,850 tonnes of milo were distributed. To correct the lack of data and the long time intervals (5-6 years) at which NSS estimates of unemployment are available, the estimates committee of Parliament has recommended that a simplified NSS format might be used by the Rural Development Departments to collect data at six monthly intervals so that the government rural employment programmes may be more intelligently planned. An export committee set up by the ministry of labour has gone further and recommended the creation of a separate ministry in-charge of manpower planning, technical education, training and employment. The reason for this rather unusual recommendation is the challenging nature of the problem of providing employment in terms of 50-60 million person days in each Plan period, rather than in more manageable terms, involving planning and operating a variety of programmes and the need for manpower planning involving in turn screening of all Plan schemes from the point of view of employment creation, human resources development (technical education and training) and utilization (employment). It recommends the training of craftsmen in ITIs and industrial establishments, with the Union government paying 60 per cent and state 40 per cent, reoriented on a modular system with a one year broad based training to be followed by specialisation that the trainee is to be equipped for and assessment of the Apprenticeship Act to provided for a comprehensive vocational training law.

To involve women more fully in the development activities of the country, the Union government is establishing 4 institutes in Delhi, Dehra Dun, Chandigarh and Madras where training is to be given to women in 32 engineering and 21 non-engineering trades, and each woman entrepreneur is to be alloted an industrial shed with all infrastructural facilities on a hire purchase basis. The programme being developed by the small scale industries development Commissioner has identified some trades—fibre, lime, bee keeping, leather, village oil, palm gur, hand made paper, village pottery, gur and and khandsari, cottage match and processing of cereals, and pulses—as industries suited to women. Self-employment avenues for women are being developed through agro-based industries, doubling the number of sevikas centres, working through 100 farmers training centres and training rural girls for 3.6 months in agriculture, animal husbandry and food processing. The Union government after study of the issue has decided against legislation for job reservation of SC & ST in the private sector or as condition for loans from public sector banks, and in place the sector is to be requested to provide such representation when issuing letters of intent. The Union minister of labour reported to Parliament that as on May 31, 1978, 1,05,180 bonded labourers had been identified by 12 state governments, of whom 1,04,749 had been freed and 31,844 rehabilitated, with Rs. 95.91 lakhs provided by the Union government as a matching grant to 9 state governments. It is very likely that the so called freed labourers have gone back to their employers for ensuring their living conditions. Further the minister reported that a National Survey conducted by the Gandhi Peace Foundation and the Na-

tional Labour Institute in 1,000 villages in 10 states—Andhra Pradesh, Bihar, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, Tamil Nadu, Uttar Pradesh and Orissa—showed, without Orissa where the survey had not been completed, that the number of bonded labour is 22.4 lakhs. This is far above the number identified by the states. There is need for national and state action to (a) identify the precise numbers and (b) develop a phased and realistic programme for their simultaneous release and rehabilitation.

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VI Other Items

Director's Section

Three special seminars were held at the Institute between the middle of December and middle of January. The first on Saturday, December 16, was on the "North South Dialogue—An Indian Perspective". The leader of the seminar was Mr. S. Guhan, IAS, former Finance Secretary of the Government of Tamil Nadu and currently senior Economist, Independent Commission on International Development Issues (Brandt Commission). Mr. Guhan presented statistical evidence to show that inequalities have been growing in the post war world economy not only between the developed (North) and the under-developed (South) countries, but also among the under-doveloped countries themselves. There is a noticeable regional pattern in the distribution of world incomes which results in the poor living also in a poor neighbourhood. Mr. Guhan also identified several major trends in the world economy especially since 1973 such as increase in money wages well above the increasing productivity and increased use of automotion resulting in the displacement of people. The need for structural changes in international trade and monetary terms was greatly felt by the poor South, among other things to minimise their dependence on the developed North for technological change. However, the individual differences among the southern countries were so many that a tailor-made overall solution to their problems could not be evolved by coming together of the developing countries themselves. Turning to India's role in the North – South Dialogue, Mr. Guhan felt that we should aim at a policy of selective self reliance and for greater cooperation with the developing countries in our own neighbourhood. There was a lively discussion following Mr. Guhan's initial presentation.

The second seminar on "The Structure of Classical Economics" was conducted by Prof. P. Garegnani of the University

of Rome, Italy. Prof. Garegnani was one of the distinguished international economists invited by the Indian Council of Social Science Research to visit India and to conduct seminars in Universities and Research Institutes. Prof. Garegnani's seminar was held on January 2, 1979. Prof. Garegnani made a brief critique of the neo-classical equilibrium approach in which prices of products and factors of production are determined by the opposing forces of supply and demand. As against this the classical approach to economics started out with an institutionally determined wage level which enabled to arrive at the surplus once the social product was determined. He went on to show that an approach to the relative price structure of commodities in terms of the relationship between wages and surplus or profit was a more realistic way of our understanding the working and dynamics of the capitalist system.

It can not be stated that the discussion that followed came up to level of abstraction that Prof. Garegnani was working with, partly because his paper was not available prior to the seminar for careful study. However, the main points that Prof. Garegnani was trying to convey were fully appreciated.

The third seminar of a very informal nature was conducted by Prof. K. Kailasapathy. Department of Tamil, University of Jaffna, Sri Lanka and a well known scholar in early Tamil Literature. In his seminar, Prof. Kailasapathy tried to look into the social life of the early periods in Tamil history through the writings of the contemporary periods. He pointed out that literature of the vety early period did not truly reflect social conditions of the times, but there were indirect evidences scattered over a wide range of writings to get some glimpses about the nature of society and social relations of the periods concerned.

UGC working group and Review Committee:

In early December the final meeting of the UGC working group on regional languages in University education was held and recommended that on the basis of progress to date all undergraduate teaching should be in regional languages by the end of the Sixth Plan and for this UGC should make available financial and other assistance in the production of books and in the orientation of teachers. In this connection it was noted that though Tamil Nadu stands first among states which have produced texts and books for undergraduate studies (in the state nearly 400 have been produced), it has the lowest percentage of undergraduates opting for the regional language at 14 per cent in BA, 4 per cent in BSc and O at B Com at Madras university, 11 per cent in BA and O for B Sc and B Com at Annamalai and 4 per cent in BA, 6 per cent in B Sc and O in B Com in Madurai, while in other universities the percentage of undergraduate using regional languages ranges from 70 to 95 per cent. The working group also decided that there be a common school frame upto standard VIII, at the end of which each school should conduct an examination in the regional language, as one means of abolishing the distinction between elite English language and other vernacular language schools. The UGC Review Committee to assess the effectiveness of V Plan programmes in light of the criticisms made by the Public Accounts Committee of Parliament held at its first meeting in mid December. It noted that as part of the decision about

centre–State financial relations of the NDC committee, the VI Plan allocation for university education while being maintained at Rs. 260 crores, has been divided about equally between the Union and states. This means that UGC's allocation which was Rs. 200 crores in the V Plan, reduced later to Rs. 170 crores, is Rs. 130 crores for the VI Plan. It was also noted that Rs. 46 crores have been made available for the first year, which means that some Rs. 20 crores will be available for each of the four subsequent years. It was therefore suggested that at NDC the importance of state governments allocating plan funds to their universities should be clearly established (in Tamil Nadu, the state government's tradition has been to match UGC plan grants and not make any plan grants) and (b) the UGC visiting committees for VI Plan which could visit each university in separate groups for sciences, social sciences and general policy should always include a state government representative and that the recommendation of the committee should be financed 50 per cent by UGC and 50 per cent by the state government. It was also decided at its next meeting to review the V Plan programmes of UGC in light of the findings of the various UGC panels.

Education Review Group :

At the request of the Prime Minister, a group met in late December to review the educational policy that the minister of education will be presenting to Parliament at its budget session. It was decided to concentrate the review on the programme of the education system with special reference to work experience, religious and moral education and character building. A further meeting of the group in January will finalise its preliminary recommendations on the National Educational Policy.

India International Centre :

A meeting of the Board of Trustees of the India International Centre in early December reviewed the recommendations of its management committee and agreed on the senior staffing pattern for the centre. Under the Director, there is to be a manager who will be responsible for the running of the hostel and the restuarant and a secretary cum programme officer to service the Board. The draft budget for 1979 was remitted to a Finance committee which was established as a permanent organ of the Board. In mid December there was a special meeting of the General Body of the Centre at which a resolution to set up a committee to review and revise the constitution was discussed and replaced by a decision to request the Board of Trustees to set up a committee to review the functioning and management of the centre and report to the July/August meeting of the General Body.

Bio-fuels :

An international symposium and training programme on Bio fuels and solar energy was run in the first fortnight of December by the Madurai Kamaraj University in cooperation with DST and UNEP. The finite character of fossil fuels was noted and the many untapped bio fuel and photo synthetic materials were recognised and specific research programmes to develop these resources were established. In the training programme, participants were trained in the development of bio fuels, the

means of increasing their productivity and the means of taking advantage of the tradition in the use of these fuels in the rural households of the Third World. One of the papers on the economics of bio fuels used at this course appears as the second article.

CIE :

The 30th Foundation day of the Central Institute of Education, New Delhi was celebrated at mid December. The Institute trains teachers for the B Ed and M Ed degrees and also has an M Phil and Ph D programme in Education. It has now been incorporated as the Education Department of the University of Delhi. The accent at the celebration was on the future of the Indian School which in its present form will be transformed into work based learning system harmonising formal, informal and non formal learning streams, with enriched teaching and learning resources made available by the Indian Synchronous satellite that is being sent up in 1980.

TNBCE, SRC and Anti - Apartheid State Committee

A meeting of the Tamil Nadu Board of Continuing Education was held in MIDS on December 23. The meeting reviewed the programmes under NAEP that are being executed by the Board and made suggestions for their further development. It also reviewed the work of the State Resource Centre and decided to strengthen its financial base and extend its training programme as NAEP projects are approved by the Union ministry. It accepted the resignation of the Secretary and placed on record its deep appreciation of her services in the cause of adult aducation and appointed Mr Sethunathan as secretary. A meeting of the Governing Body of the State Resource Centre was held in early December to review its programme of activities, which should include the training of supervisors and project officers for the state government NAEP projects. It also approved the budget for 1979-80. The second meeting of the State Anti-Apartheid Committee was held in early December at which the results of the seminar were reviewed (see Vol VIII p 608), the constitution of five district committees approved, the budget of Rs. 49,000 established and the programme of oratorical and essay competitions in schools and colleges, the touring of the exhibition, the showing of the films and the collection of funds from the public for aid to the Southern Africa Apartheid fighters decided and approved.

Meeting of Economists

As noted earlier, the meeting of 30 economists called by the Planning Commission to review the Sixth Plan was held in New Delhi on December 17 and 18. The meeting was attended by economists from the finance ministry as well as by the Governor of the Reserve Bank (the latter for the first time) at which the employment targets, the objectives, the financial requirements and the institutional arrangements were reviewed. A number of suggestions were made in regard to finances and institutional changes which were noted with approval by the Deputy Chairman.

IEA

The concluding session of the Diamond Jubilee conference of the Indian Economic Association (see Vol VIII pp 100—101) was held on December 24,

25 and 26 at the Indian Institute of Technology, Powai, Bombay. Attended by 1,000 economists from all over the country, it was inaugurated by the Prime Minister who asked the economists to help plan for a low cost economy and the Presidential Address delivered by the president, Professor Gautum Mathur who expanded on his capital theory. The conference worked on Malthus, the theory of taxation, financial intermediation and rural development and multinationals. It elected Professor V Shanmugasundaram as the President for 1980.

Rajya Sabha

Rajya Sabha functioned till December 26 when it was prorogued Amomg the bills that it enacted were the sugar undertakings Bill, the Bonus Bill, and the amendment to the Criminal Procedure Code Bill. The Consultative Committees attached to all the ministries met during the session. There was also a meeting on Gandhiji's contribution to National Development.

January Seminar

The paper for the January Development Seminar "A Review of the Tamil Nadu Economy—1970-77" by Mrs. Y Shanmugasundaram together with a summary of the discussion on the paper at the seminar held on 25th January 1979 under the Chairmanship Mr. M Srinivasan appears as the first article.

Second Article

A paper, Some thoughts on the Economics of Bio fuels in the energy system, appears as the second article.

Book Reviews

A *review* by Dr Raj Kumar, Prof of Economics, Autonomous Post-graduate Centre, Coimbatore of the publication "Land and water resources of Coimbatore District" by Professor R K Sivanappan and Dr P K Aiyasamy and a review by Dr K Venkatasubramanian, Director of School Education, Government of Tamil Nadu of MIDS publication No. 17, "Rural Primary Education and Adult Literacy in Tamil Nadu", by Mr Alexander Joshua, the retired Deputy Director of the Institute appears in the Book Review Section.

A Review of Tamil Nadu Economy: 1970-1977

By

YASODHA SHANMUGASUNDARAM

Madras

Evaluating the performance of an economy is an essential exercise to serve as a guideline for the immediate goal of a fair deal for the common man. Standards and criteria for evaluation vary according to the needs of the time and nature of the study. This paper makes an attempt to review the Tamil Nadu economy between 1970–1977. It is necessary to estimate the economic performance both in terms of efficiency or in terms of equity and distributive justice. No single criterion is adequate for the purpose and therefore multiple criteria are to be identified and justified in this study of evaluation.

In mathematical language Tamil Nadu economy is a sub set of the total economy of India identified with but not necessarily identical to the latter. This interdependence is to be borne in mind in regional studies like this which naturally have to assume *ceteris paribus* for the rest of the economy. Failure or success to a large extent is conditioned by such inter-regional dependencies.

Efficiency in the performance of an economy may be gauged in terms of purely economic indicators like growth rates, inter-regional comparisons of State *domestic products, per capita* State incomes, the contribution of State Domestic Products to the national product and the level of employment. These are aggregatives and more insight could be gained in terms of details relating to the various sectors of agriculture, industry and others. These general and particular indices only give part of the picture of the economy. In the context of developing economies like ours efficiency has to synchronise with equity and justice. Growth with justice is the acclaimed desideratum and the paper attempts an evaluation in terms of distributive justice for which purpose a few *ultra* economic indicators are made use of. The following three sections respectively relate to the place of the Tamilnadu economy in the all India setting, an assessment of the economy in terms of certain efficiency criteria and an appraisal of the development potential in terms of equity criteria. Studies of this nature have to necessarily explore beyond economics, for in the ultimate analysis development cannot be piecemeal.

I

To focus attention on the State of the Tamil Nadu economy it is necessary to identify its differential characteristics. A current estimate for 1978 shows that area-wise, Tamil Nadu is a small state (130,000 sq. Km.) with only five States smaller than itself, viz. West Bengal, Assam, Punjab, Haryana and Kerala. With an average rainfall of 97 cm which is rather inadequate to support a large population of 467 lakhs, Tamil Nadu is one of the densely populated States in India with 359 persons per sq. Km. Net sown area is 43% of the reporting area and though one of the widely irrigated States next only to Punjab and Haryana, the gross irrigated area is not more than 47% of the gross cropped area. In terms of agricultural productivity for Tamil Nadu as a whole the rank is rather low though Thanjavur District or South Arcot District has set the highest all India levels of productivity and this, to a large extent, accounts for the low per capita State income of Rs. 941 at current prices for 1976-77.

The Table—1 shows the place of Tamil Nadu in the all India setting in comparison with 15 major States of India.

TABLE 1

THE STATE OF THE TAMIL NADU ECONOMY

	Items	Units	Rank among the major States of India
1.	Area	130,000 Sq. Km.	10
2.	Estimated population (1978)	467 lakhs	7
3.	Density (persons per Sq. Km. (1978)	359	4
4.	Average normal rainfall	97 cm	10
5.	Index of Infrastructure development 1976-77	152	3
6.	Net sown area as % of reporting area 1974-75	43	9
7.	Gross irrigated area as % of gross cropped area, 1976-77	47	3
8.	Average per capita food grain production—1976-77 to 1978-79	164 Kg.	10
9.	Annual rate of increase in food grain output between 1961-62 and 1977-78	1.9	10
10.	Per capita domestic power consumption, 1976-77	12 Kwh.	7
11.	Villages electrified by March end 1978 (%)	99	3
12.	Per capita State Income at current prices : Average of 1973-74 to 1975-76	Rs. 857	8

Source: Economic Indicators. States of India. Centre for Monitering Indian Economy, (Bombay, Dec. '78)

In terms of the twelve indicators included in the table above the picture of the Tamil Nadu economy appears inadequate except in terms of electrification, irrigation and infrastructure. Surely there are indicators which can also be cited to dispel dismay to a certain extent. Literary levels, health standards and urbanisation criteria are good enough to guage the level of development of an economy, particularly the potentials of an economy. Tamil Nadu has the highest literacy level (40%) next to Kerala. It records 30% of urbanization and the health services actual and potential in Tamil Nadu are perhaps the best in India.

The foregoing discussion strengthens the hypothesis that mere correlation and growth rate studies are inadequate and mechanistic without proper behavioural studies. Evaluatory studies should be in terms of as many indicators as possible.

II

A recent report records an impressive growth rate for the Indian Economy for 1977-78 at 7.4%. A contributory factor for this realization beyond expectations was the record foodgrain production of 265.8 m. tonnes last year when the growth rate was only 1.4%. There is significant increase in per capita real income at Rs. 690 in 1977-78. There was a decline to the extent of 0.6% in 1976-77 whereas in the next year there has been a 5.2% increase. A quick estimate of the Tamilnadu Statistics Department puts the growth rate of State Domestic Product for 1976-77 as 3.4. Since 1970-71 SDP at current prices has increased from Rs. 240,386 lakhs to Rs. 437,578 lakhs in 1976-77 which works out to an average growth rate of 10.5%. Estimated at constant prices the growth rate is only 2.8%.

Though a long term review of State Income is meaningful for long term analysis, this paper is confined to annual variations between 1970 and 1977 to limit the scope of the paper to a study of the seventies. Except in 1974-75 when there was a decline of 10.4% over the previous year, the Tamil Nadu economy has been normally on the uptrend, except for the year 1974-75 which was an abnormal year of unprecedented drought. An encouraging feature in this regard is the momentum gained by growth rate of State income from 1.0% during the III Plan to 4.0% in the IV Plan. There has been a setback in the first two years of the V Plan with growth rate constrained to 1.8% only which warranted the utter need to maintain an annual rate of growth of nearly 9.0% for the succeeding years to maintain the target of 5.5% annual growth rate. The potentiality for a growth rate in the range of 7.5% to 11% exists in specific sector like Fisheries, Animal Husbandry, Dry farming and Forestry provided science and technology and appropriate pattern of investment are applied to these sectors with appropriate economic administration.

Normal practice in studies like this is to treat the SDP, the geographical product, on a par with net domestic product of India. Inter-state and external income flows are also of considerable importance in the economies of such dimentions as the States of India, all of which are in the process of accelarated development. Want of relevant data limit the comparative analysis purely in terms of the SDPs.

It is necessary to focus the relative contribution of the States to the National product of India to make inter state comparisons. The following tables present the growth of NDP of India and per capita SDP of Tamil Nadu and its share in the NDP between 1960-61 and 1970-71 to 1976-77.

TABLE 2

TRENDS IN SDP OF TAMIL NADU AND NATIONAL DOMESTIC PRODUCT AT CURRENT PRICES

(Rs. in Crores)

Year	NDP	SDP of Tamil Nadu	Per Capita NDP Rs.	Per Capita SDP of Tamil Nadu Rs.
1960-61	13,263	1,112	306 (306)	334 (334)
1970-71	34,462	2,404	637 (353)	588 (348)
1971-72	36,332	2,716	657 (349)	653 (362)
1972-73	39,643	2,906	702 (337)	685 (358)
1973-74	49,396	3,596	856 (349)	832 (369)
1974-75	58,137	3,793	989 (343)	852 (309)
1975-76	60,293	4,037	1,005 (366)	887 (358)
1976-77	—	4,378	—	941 (362)

Source : Compiled from Official data

(Per capita estimates at constant prices are given in brackets).

TABLE 3

SHARE OF SDP OF CERTAIN STATES AS PERCENTAGE OF ALL INDIA NATIONAL DOMESTIC PRODUCT

(At current prices)

	1960-61	1970-71	1971-72	1972-73	1973-74	1974-75
Andhra Pradesh	7.4	7.2	7.5	7.4	7.8	8.0
Assam	2.5	2.2	2.2	2.3	2.0	2.2
Bihar	7.4	—	—	—	—	—
Gujarat	5.5	6.4	5.9	5.1	6.2	5.1
Haryana	1.8	2.4	2.6	2.6	2.5	2.3
Jammu & Kashmir	0.7	0.7	0.7	0.7	0.7	0.7
Karnataka	5.0	4.4	4.6	4.5	4.2	4.3
Kerala	3.2	3.5	3.3	3.6	3.6	3.4
Madhya Pradesh	6.2	5.8	6.1	6.3	6.6	6.4
Maharashtra	12.0	11.5	11.6	11.3	11.8	11.9
Orissa	2.8	3.1	2.9	3.3	3.3	2.8
Punjab	2.9	3.8	3.8	3.9	4.0	3.7
Rajasthan	4.2	4.5	3.9	3.8	4.3	3.9
Tamil Nadu	8.3	6.8	7.3	7.1	7.1	6.2
Uttar Pradesh	13.8	12.7	12.6	14.4	13.2	13.1
West Bengal	10.0	9.3	9.7	9.0	8.0	8.5

Source: *Reserve Bank of India Bulletin* (Bombay April 1978) Statement 5, p. 287

An analysis of estimates of State Domestic Products by the Reserve Bank of India ranks Tamil Nadu as the 6th State in terms of per capita SDP. (Fluctuations in agricultural performance are smoothened by a three yearly average centred in 1970-71 in ranking the States as follows).

TABLE 4

RANK ORDER OF STATE INCOMES

Per Capita Income	Number of States	Names of States (Per capita income in brackets).	
Below 500	2	Bihar (403) Orissa (490)	
500-550	5	Madhya Pradesh Uttar Pradesh Assam Karnataka Jammu & Kashmir	500 504 517 522 531
550-600	4	Rajasthan Kerala Andhra Pradesh Tamil Nadu	560 566 578 585
600-650	—	—	
650-700	—	—	
700-750	1	West Bengal	747
750-800	2	Gujarat Maharashtra	782 797
800-850	—	—	
850-900	1	Haryana	861
Above 900	1	Punjab	984

Source: Compiled from Reserve Bank of India Bulletin, (Bombay April 1978 p. 282)

In terms of State Income or SDP and per capita income. *Tamil Nadu has fared* well in absolute and comparative terms particularly since the seventies. A Reserve Bank of India estimate states that Tamil Nadu has remained below the All India growth rate throughout 1960-61 to 1975. During this period the growth rate at the all India level was about 11% at current prices and 3% at constant prices (with 1960-61 as base year). In Tamilnadu the growth rate of per capita income has accelerated between 1960-1975 at 5.78%. But a break up into shorter periods shows that between 1960-61 to 1964-65 at 5.11%; between 1965-66—1969-70 at 6.81% and between 1970-71 at 8.96%. The respective rates for All India are 8.60%, 7.68% and 10.75% and the average growth rate between 1960-61 to 1974-75 was 9.04. Price fluctuations affect the movements to a large extent and hence the comparison in terms of *constant prices. The drastic price fluctuations undergoing* in the economy *make it necessary to* shift the base year to a recent period and computations are *in* progress with 1970-71 as the base year... Data thus processed may be more meaningful for evaluation and policy guidance. Yet another limitation is the fact that statewise estimates are compiled by individual State Statistical Bureau. Despite their adopting uniform concepts and definitions strict comparability is not possible because of differences in the sources and quality of data available at the State level. Methods of estimation are conditioned by the type and quality of available data and hence cruder methods have to be used wherever data base is weak. In terms of productive resources, Tamilnadu has 8.2% of total work force of India and 4.5% of land area under cultivation. The net result of economic performance is 6.9% share in the National Domestic Product. (These figures relate to the year 1970-71).

Economic activities in an economy—though not in the modern activity analysis—comprise three distinct sectors, Primary, Secondary and Tertiary. The distinction between economic overheads like irrigation and flood control, power, roads and bridges, transport and communications and social overheads like *education*, health, housing and welfare services is quite clear, and yet data base of the Indian economy is still tradition bound and the data available compel us to follow the three fold sectoral classification in the analysis of shifts of state income between the sectors. Each sector has a different production process, follows distinct techniques and organisation, and sectoral shifts in income and product are meaningful indicators of economic development and progress. Sectoral share analysis avoids price movement distortions in the assessment of growth rates and serves as a satisfactory criterion for assessing internal development and progress. Particularly a positive sign of development in many advanced economies is the decreasing importance of the *primary sector in the long run.* The primary sector is still the major sector. The importance of the tertiary sector also is gaining ground in the Indian economy. The tertiary sector's share is higher than that of the secondary sector.

Performance of the primary-agricultural sector in the entire economy is very unstable for obvious reasons. This instability to a considerable extent affects comparison of movements in shares in the three sectors. A noteworthy feature, however, is the falling trend in the share

of the primary sector in the NDP as well as in the SDPs of most states. Generally the share of sectoral incomes at current prices differ significantly from that at constant prices. Only in Tamil Nadu the movements of share of primary sector at current and constant prices are close and in many years the share of primary sector at constant prices is higher than the share at current prices a phenomenon which is not observed in any other State.

There is considerable association between changes in per capita income and the shifts in sectoral shares of SDP. In 1960-61 the share of the primary sector in SDP was 52.09. This has shown a decline from 39% to 34.5% at current prices (and from 42.0% to 31.8% at constant prices) as the per capita SDP has risen from Rs. 334 to Rs. 852 at current prices between 1970-71 to 1974-75. Relative shares of SDP at current prices and constant prices are given in the table below:

TABLE 5

SECTORAL DISTRIBUTION OF SDP: TAMIL NADU

(Percentage)

	At current prices			At constant prices		
year	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary
1960-61	52.0	17.6	30.4	52.0	17.6	31.3
1970-71	39.1	24.7	36.8	41.8	24.2	34.0
72	41.7	23.1	35.3	42.3	23.6	34.1
73	39.8	23.4	36.7	41.1	24.3	34.6
74	41.2	24.4	34.4	39.4	24.6	36.0
75	34.5	28.1	37.4	31.8	29.4	38.8

Source: Statement No: 9. Percentage share of Primary, Secondary and Tertiary Sectors in State Domestic Product. *Reserve Bank of India Bulletin* (Bombay, April, 1978), p. 295.

A more detailed analysis of the composition of State Income is available from the quick estimates of the Directorate of Statistics, Tamil Nadu. State Income is made up of 5 major components-Primary Sector (Agriculture, Forestry, Fishing, Mining and Quarrying), Secondary Sector (Manufacturing, Construction, Electricity, Gas and Water Supply), Transport and Communication

Sector (Railway, Transport, Communications Trade, Storage, Hotels and Restaurants), Finance and Real Estate sector (Banking and Insurance, Real Estate and ownership of dwellings) and community and personal services sector (Public administration and other services). In 1976, the net State domestic product was made up of 35.8% from the contribution of the primary sector, 26.9% from the secondary sector and 37.30% from the other sectors:

TABLE: 6

NET DOMESTIC PRODUCT AND ITS COMPONENTS

Items	1970-71 Rs. in lakhs	% of total	1976-77 Rs. in lakhs	% of total
Primary Sector	96,180	40	1,56,805	35.8
Secondary Sector	58,356	24.3	1,17,795	26.9
Transport & Communication	44,296	18.4	86,577	19.8
Finance & Real Estate	10,191	4.3	22,986	5.2
Community & Personal Services	31,363	13.0	53,415	12.3
Net State Domestic Product at Factor Cost	2,40,386	100	4,37,578	100.0

There has been shifts in sectoral shares in absolute terms in all sectors and the relative decline of the primary sector indicates the extent of economic progress in the region. Despite the shifts from the agricultural to other sectors of the economy, it is by far the most important sector contributing more than a third of the State Income and provides the basic needs of life in terms of production, consumption and employment. Agricultural production and yield per hectare show a continuous uptrend in all items except in the case of groundnut and gingely and Tamilnadu is not yet a major producer of these two products, though South Arcot District has proved its capability to reach high rates of productivity in groundnut.

There has been an appreciable increase in the agricultural sector. With 1969-70 as the base year the index of Agricultural production for 1976-77 was 123.2. This increase is due more to improved productivity than to increase in acreage under cultivation. Fertilizer use in agriculture shows substantial increases in recent years. In 1970-71 the per hectare application of fertilizer was 26 kg and in 1977-78, it has risen to 64.6

kg. per hectare. Similarly mechanisation of agriculture sustains this trend. In spite of the increase in agricultural production, per capita availability of food grains in Tamilnadu is estimated at 177 kg. for 1977-78 which is still below the standard nutritional requirement. The sectoral interdependence even within Tamil Nadu economy need no emphasis. With low rainfall and frequent drought, irrigation limits agricultural development. There has not been much increase in the area under irrigation since 1960-61. The mainstay of Tamil Nadu agriculture is irrigation by tanks and wells (70%). Unless the region is protected from the vagaries of monsoon like acute droughts and unprecedented floods its agricultural economy will remain unstable and render instability to the entire economy of Southern India.

TamilNadu is the most industrialised of the four southern states and occupies the third all India place in terms of industrial development after Maharashtra and West Bengal. Considering 1970-71 as the base year, the General Index of Industries in 1976-77 was 136.6 inspite of the erratic performance of the industrial sector. Supply position of most of the raw materials was comfortable, power position was easier and industrial climate has been more or less peaceful. Except for the farm based industries affected by climatic condition, important non-agro based industries have witnessed growth of varying degrees. The following table presents the production performance of select major industries classified according to use.

TABLE : 7

PRODUCTION IN SELECT INDUSTRIES IN TAMIL NADU

Basic Goods	Units	1970-71	1976-77
Basic goods			
Cement	000 tonnes	2,393	3,295
Caustic soda	,,	109	94
Mixed Fertilisers & Superphospate	,,	235	548
Electricity	m. kwh.	5,274	8,063
General goods			
Power transforms	000 KVA	949	1,131
Electric Motor	000 Nos.	94	99
Intermediate goods			
Cotton yarn	000 tonnes	176	185
Tyres	,,	665	7,177
Camel back	000 Kg.	6,664	1,976
Consumer goods			
Cotton woven piece goods	000 metres	1,73,780	1,67,107
Tea	000 tonnes	54	56
Sugar (refined)	,,	329	192
Bicycles	000 Nos.	392	341
Motor cycles	,,	10	18
Wheat products	000 tonnes	228	138

Source: Compiled from official Data.

Appreciable progress is made in the industrial sector. In 1970–71 there were 6,344 factories employing 4.32 lakhs persons and these figures increased to 8,196 and 5.05 lakhs in 1976-77. A good indicator of industrial progress is the quantum of electric power consumed by industries. Installed capacity has increased by more than four times since 1960 and the consumption per head has risen from 112 units in 1970–71 to 146 units in 1976-77.

Textile industry the largest industry in the state is under heavy losses owing to the steep rise in the prices of cotton since 1976. Import of cotton and viscose and relief of excise duty and subsidy for production of controlled cloth help the industries to a certain extent. The progress has been modest and employment potential has not increased. The total production of yarn as well as cloth has declined by 7% between 1970 and 1975. Added to this fall Tamil Nadu experienced an unsold stock of as much as 21% of yarn produced in 1975 in addition to the 17% of unsold stocks of the earlier years. Textile industry in the state is in a state of unfair and ineffective competition from other states of India and instruments of control at the all India level have not been used to protect the otherwise well established and reputed textile industries in Tamil Nadu. As in Textile industry, so does Sugar Industry also present a picture of unhealthy interstate rivalry largely due to reasons of political economy. There appears to have been a deliberate reduction in the share of Tamil Nadu in India production from 9% from early seventies to 4.2% in 1975. It is well known that the all India sugar cane price policy has been arbitrary, and political and consequently the quantity of cane crushed has declined from 3.3m. tonnes to 1.9m. tonnes during the same period. Sugar, foodgrains, vegetables etc., are besic consumer goods and the economy ought to be able to generate at least 8% of all India production to meet its population share and avoid dependence on other States.

The employment position appears to have improved very little and even an increase of 2 lakhs of employment in public sector was counteracted by a decrease of 1 lakh employment in private sector during 1970-77. Though this is a better performance in terms of the all India position, it is not adequate to meet the situation of unemployment in Tamil Nadu which has a backlog of Third and Fourth Plans to the extent of 2.7 and 5.9 lakhs. Educated unemployed which was 35% in 1969 has risen to 56% in 1977, and of them 94% are arts and science graduates. Educated unemployment seems to be a paradox of investment in human resources and non utilisation of it.

The economy presents a mixed picture of ups and downs in industrial and agrarian output and productivity. The reasons are not far to seek. It is still the foremost industrial state in the southern region and yet there are major challenges to its traditional industries like textiles and sugar, handicrafts and agro industrial units. This is because of the policy of encouragement to the backward states under aegis of all India planning which enabled backward states in India to take to these relatively easy sectors of industrialisation. Growth rate studies

limited as they are in their methodological role, highlight these weaknesses in Tamil Nadu without global perspectives. The strength of the Tamil Nadu economy consists in areas not revealed by growth rate studies like the high degree of urbanisation, excellence in the quality of general and basic education and the quality of fundamental higher education, health services including family welfare, nutrition and preventive medicine. The size of the post matrics awaiting employment constitute a tremendous potential for a break through in skill intensive industries like electronics, qualitative and non ferrous small scale industries, sophisticated organization and sales of commodities both at the national and international levels in terms of fisheries and agro industrial production.

III

This section presents the equity aspects of the Tamil Nadu economy. The State was a fore-runner in social reform movement in early twenties and thirties. Persons like Chakravarthy Rajagopalachari and Bhashyam Iyengar, and other politicians like Kamaraj took interest in prohibition and Harijan Welfare movements. Periyar E V Ramasamy and Dr C N Annadurai, their able followers who formed successive Tamil Nadu governments have made considerable impact on the making of the society and polity of the State in terms of reservation of jobs for the backward and under-privileged classes and Tamil nationalism thereby involving cultural ethos in the awakening of the rights and duties of the people. As a consequence it was easy for successive Governments of Tamil Nadu to implement welfare measures like family planning, quota system in the admission to educational institutions, reservation of jobs in all public sector occupations and prohibition of intoxicating liquor to an extent to which it has not been possible in many states of India.

The percentage of enrolment of education in the age group 6–11 has increased from 70 to 92% in the 1970s notwithstanding the relatively non-innovative characteristics of the educational system in terms of either content or administration. This is largely due to the demand, induced by the people themselves. The quality of academic education is substantially better than that obtaining in many States though in recent years some hasty and initiative steps have created some hazards to quality. Compared with China or the U.S.A., education is neither wholly social development oriented or market oriented. In spite of this dilemma, the number of people from this State who have migrated to other States and to other countries and international organizations, is the best index of the export quality of Tamilnadu education. The quality of life has been sustained by strong family based informal systems and institutional education in Tamil Nadu such that men abroad are anxious to return and are returning to the socio-economic mileu of the State. This is a qualitative appraisal of education, and its potential which cannot be presented in quantitative terms. Social distributive justice should be taken care of while passing judgement on some restrictions and quota systems, which are misunderstood by less socially conscious.

When the rest of India has been talking in terms of Harijans while all the time entrenching the most privileged castes and eletist groups, in Tamil Nadu

a wide range of untouchables, tribes and socially backward groups who form more than 80% of the population have been taken care of. This is in spite of assaults on them by vested interests, and upper classes which are both subtle and ruthless, whenever opportunity arises or is snatched. Social revolution is still in the making but the ground is ready in Tamil Nadu.

Parliamentary democracy has been strong because of the clear mandate of the people for one party or the other in categorical terms except in one spell (three decades back) in which Rajaji had to do tight rope walking to encounter the formidable opposition of the Communists. Otherwise the Tamil Nadu government has had a comfortable majority in the legislatures. And often political realism has eschewed armchair exponents and unreal products of the so called institutes of higher learning for leadership of the masses.

Investment in health has substantially increased. So intensive has been the investment in the training of doctors that there are 1900 doctors awaiting placement in secure government hospitals. In the alternative they render private medical service either at home or abroad and add to the domestic product. There has been a 70% increase in the number of private non-aided hospitals and dispensaries. The number of beds in hospitals has increased to 41,000 in 1975 from a figure of 36,000 in 1969 (an increase of 11%). In the area of family welfare the record of Tamil Nadu has been successively acclaimed as the best in the country. The death rate had declined from 1.05% in 1970-71 to 0.83% in 1976-77, and the birth rate from 2.72% to 2.29% for the same period. Infant mortality rate has decreased from 6.6% in 1965 to 4.7% in 1975. Preventive medicine, public health and sanitation and water supply are still vulnerable areas and require systematic programme of action. The gap that has to be filled in areas of higher education, social sciences and health pertains to Research and Development. It is now the monopoly of the Government of India and their numerous agencies. Tamil Nadu, for instance, has to increase the measly sum of Rs. 5,000 per annum for medical Research to a substantial level of a crore of rupees. So too R and D outlay has to be stepped up.

The Housing Schemes of Tamil Nadu government are contributory factors towards a Welfare State. The achievements in respect of middle income and low income groups have exceeded the target. Village housing scheme is yet to become effective. Particular mention must be made of the major breakthrough in the provision of housing to the scheduled castes. Similar performance is made in respect of slum clearance scheme in the urban areas. Nearly twenty thousand tenements were constructed between 1970 and 1977 at an approximate cost of Rs. 22 crores.

Successive Tamil Nadu governments have evinced great concern over developmental schemes geared to social betterment. While in all the States of India Developmental outlay of the State governments is on the decline in past few years, Tamil Nadu has been maintaining a high proportion of nearly 70% of the total expenditure. Per capita development expenditure has doubled during the period 1970-1978.

TABLE : 8

PERCAPITA DEVELOPMENT AND NON-DEVELOPMENT EXPENDITURE 1970-71 to 1977-78

Year	Development expenditure Rs.	Non-Developmental Expenditure Rs.
1970-71	54.40	30.77
1975-76	101.01	40.25
1976-77	106.23	48.28
1977-78	109.23	49.48

The *Justice Shelat Commission* (1978) recommended the cancellation of public debt arising out of small savings account. This has not been accepted. The Debt burden of the Government of Tamil Nadu is considerable. This is due to large remitances to the Government of India by way of principal and interest charges, in all amounting to 20% of the non-developmental expenditure.

The official statistics point to the very low growth rate of 3.38% in Tamil Nadu during 1960-61 to 1974-75 and 0.32 between 1970-71 to 1974-75 (at constant prices). All India real growth rate per capita also shows a similar decline from 2.45 to 0.10 between 1960-61 to 1974-75. Justification for this poor all India performance also follows *immediately in terms of the counter* effects of inflation. This is true equally of the State incomes. The discussion on equity grounds unfolds the areas not covered by the traditional economic indicators and, also those not easily amenable to quantification. There is "quiet transformation" taking place in the economy. Particularly the rural areas are pushed away from stagnation and are pulled along a new stream of dynamism. Hopefully with increased federal practices in India and decentralization within the State we may conclude that *in Tamilnadu the ground is well* prepared for a big push and a major socio-economic change towards a higher standard of living and better quality of life of socio-economic equity.

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Summary of Discussion

While presenting the paper, the author said that Tamil Nadu being a subset of the total economy of the country can be identified with but need not necessarily be identical with it. And hence different conclusions on the economic performance may emerge at the state and national levels. Economic performance can be evaluated by using both efficiency and equity criteria. While efficiency can be measured in terms of economic aggregates like N. S. D. P. and percapita income etc., equity can be measured in terms of certain aspects like housing, urbanisation, health and education etc.

Dealing with the aggregate economic performance of the state, she said that the state's income and percapita income had gone up both at constant and current prices. In these aspects the State has done well in comparison to other states. She also felt that the state can witness an accelerated rate of development in the coming decade.

But the author felt that it was not possible to make any strict evaluation of the state's economy because the statistical data is quite elusive and the economic aggregates are most often misleading. However a disaggregated analysis of sectoral contribution to the state's economy can throw some light on the true nature of Tamil Nadu economy.

She explained that over the years, the relative importance of primary sector was decreasing and the importance of other two sectors was increasing. And the performance of secondary sector is much better than the tertiary sector. She found negative correlation between the decrease in the Primary sector's contribution to the state's economy and the increase in the per capita income of the state. Even-though the contribution of the primary sector is relatively decreasing, still agriculture is a major source of employment and earnings to the majority of our population.

Referring to the iudustrial development of the state, she said, that eventhough the growth of industries in Tamil Nadu is somewhat faster than the other states, some of its industries like textiles had to suffer a lot, and the industrial productivity, over the years has also gone down. This feature, she attributed to the inadequate funds allotted to the states industries during five year plans by the non-cooperative nature of the Central Government and the use of traditional technology in our industries.

She also said that eventhough the employment in the public sector had gone up by 2 lakhs, this increase was thwarted by a lakh decrease in the employment opportunities generated in the private sector.

She also explained that in comparison to other states, Tamil Nadu had done well in the fields of health. education, housing and urbanisation. These, she felt are signs of rapid economic development in the state. Thus, there emerges a mixed pattern of development with some sectors growing and some others lagging behind.

She opined that this better performance of the state's economy was made possible due to political stability given by the political parties of more or less some ideology and to the consistent budget allocations on the developmental programmes of the state.

Judging from the performance of the different sectors of state's economy over the past years, the author concluded that the stage was set for the rapid development of the state.

In the discussion of the paper that followed, it was pointed out that while the author was aware of the fact that the aggregates are most often misleading, she had made use of the same aggregates to evaluate the economic performance of the state. Some of the indicators like urbanisation that she had selected for evaluation were not only inadequate, but can also reflect the dark picture of an economy. For e.g. it was pointed out that while urbanisation besides being a sign of economic concentration can also be a sign of rural poverty. It was also suggested that the author could have made use of N.S.S. data on consumption patterns and some of the studies on the poverty of Tamil Nadu for evaluating the performance of state's economy.

The authors conclusion that the stage was set for the rapid development of Tamil Nadu was also contested by pointing out that with the kind of development that was taking place, land and assets were increasingly getting concentrated in a very few hands and this itself may arrest the pace of development in the future. Infact, it was pointed out that if the development process is judged in terms of the benefits accruing to different sections of the population it was difficult to say that even the past performance was satisfactory.

The Seminar was chaired by Dr. M. Srinivasan.

SOME RANDOM THOUGHTS ON THE ECONOMICS OF BIOFUELS IN THE ENERGY SYSTEM*

By

MALCOLM S. ADISESHIAH

Bio fuels in the Energy System

Some General Considerations

The study of Bio fuels and the means of measuring their productivity, which has been your preoccupation in the International Symposium and more particularly in the training course over the past fortnight, assumes importance when set within the Energy system of the World as a whole or of the Third World. There is a reason as you will see later, for me to make this somewhat unfashionable (and to many natural scientists unscientific) distinction between the world globally viewed and the Third World as a distinctive entity.

Energy is difficult to define because of its conceptual abstractness, somewhat like the mathematicians zero, but for the economist it is viewed simply as the capacity to work and the rate at which this is done becomes its measure. Most fuels release this capacity—energy—in the form of heat and hence the measuring rods of the kilo litre, the kilo calorie, the metric ton (of coal or oil) per unit of time are used to measure the efficiency of any fuel.

The Energy source for all plant and animal life and their growth is the sun-both for living plants and animals, and those stored away many millions or billions of years ago in the bowels of the earth, which are over convertible fuels today of coal, oil and natural gas. One of the problems that we face with regard to these fuels is that just as their existence in the result of storage over time, their use involves their withdrawal also over time, with the withdrawal rate far exceeding the storage or regeneration rate. To put it simply, these conventional fuels produced by photo synthesis over thousand million years will not be used in 200 years, of which perhaps 120 years have already gone. Thus all fossil fuels are finite in volume and hence our resource and technology is now turned to probing non fossil fuels, of which bio fuels is one, the other important ones being wind power, direct solar radiation, ocean thermal gradient, geothermal energy and nuclear energy.

Is there any energy crisis?

Are we right in describing these current and coming energy problems and

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Validictory Address to the International Training Course on Biofuels, Bioproductivity and Photo Synthesis, Madurai KAMARAJ University, Madurai, Saturday, December 16, 1978.

shortages as the energy or fuel crisis for the world community or the Third World?

My own answer is NO.

For the World community, all that is needed is some restraint in the incredible rate at which the industrialised countries are using the world's energy resources. One of them with 6 per cent of the world's population is consuming annually over 35 per cent of the world's energy. For the Third World, all that is needed is a little more even distribution of existing energy resources, in place of the industrialised countries consuming annually 99 per cent of the total world energy production of 7,000 million tonnes of coal equivalent and the Third World consuming less than 1 per cent of that total. There is a human and societal crisis, there is no energy crisis.

There are energy problems confronting us. We in the Third World are just starting on our own self reliant path of national development to remove our massive poverty condition and assure a minimum of human well being to all our people. This involves an increase in the use of energy in our agriculture and manufacturing industries and in our homes from the present less than 1 per cent of aggregate annual world energy consumption to something nearer at least half of what we in the Third World produce as energy, which is 28 per cent of the world total.

There are also energy bottlenecks that we in the Third World face in regard to the operation of our irrigation wells, our fertiliser factories, our textile mills, our thermal steel, aluminium, sugar and cement plants and even for our limited domestic purposes. To remove these bottlenecks as well as to meet our growing development needs, my estimate is that energy use in the Southern Hemisphere will have to expand from the 10 times referred to earlier to something like 20 times over what is in use now by the end of the current century.

In the meanwhile, the world globally is faced by the fact that at the rate at which we are using them, the world stock of fossil fuels may not last us beyond the mid point of the next (21st) century. It is in relation to this factual problem, that I propose a trilateral policy discussion of: (a) raising the price of fuel high enough to represent its real cost and force its rational use; (b) ensuring less inefficient use of our energy fuel resources; and (c) engaging in a massive programme of Research and Development on alternative non fossil energy sources, including bio-fuels. May I elaborate on these three lines of action, which are, however closely interrelated.

Pricing of Energy

We should end the long era of uneconomic low energy prices which has landed us in the present parlous position and price the existing fuel and energy resources so high that it will result simultaneously in compulsory conservation, less inefficient use of energy and the generation of the massive resources needed for the Research and the application of its results in alternative sources of non fossil energy and bio fuels, which we today dismiss as being too expensive from the economic point of view. In my opinion there is no alternative to this high pricing of energy, as reliance on appeals to voluntary

conservation efforts and voluntarism generally as much as the appeals to the scientists' sense of patriotism is good rhetoric but bad economics.

And when I refer to adequate and proper pricing of energy sources, in the case of oil, for instance, I do not necessarily mean pricing beyond a real $ 11 a barrel oil price, for which we wrongly blame the OPEC group of countries. I wonder how many of us know that in 1967 (long before the formation of OPEC), out of the price of $10.739 for a barrel of oil as it was then selling in Europe and Asia, $5.1 was the oil tax revenue accruing to the European consuming countries, who had of course done nothing to produce this energy source, while the actual producing countries in the Middle East received as revenue $0.853 per barrel. When OPEC raised oil prices, it need not have resulted in a price rise to the consumer, if the consumer countries had agreed to their revenue being 3 times instead of 6 times that of the oil producing countries. I spoke of real oil prices, because OPEC's raising of oil prices from $3 a barrel to $11 has been eroded to a real rise of $5 today, as a result of world inflation, once more led by the industrialised countries, and if the current world inflation rate continues, the real oil price will be back to $3 per barrel by 1980. For the inflation that we have witnessed and experienced ourselves all over the world, including the Third World, we again wrongly blame it on the OPEC crude oil price rise. We do it here in India. This may be good political camouflage but it is wrong economics. Without going into the details, because this is neither the time nor the place for it, I want to say that of the inflation in the industrialised as well as in the Third World countries, where the annualised inflation rate has been 15 per cent, only 4 points of that inflation has been due to the packed up OPEC prices, the major part–11 points constituting 70 per cent of the total,—has been due to (a) increase in each country's money supply, (b) the accelerating deficit spending of our governments and (c) capital, labour and other related cost push factors.

Less Inefficient Energy Use

Alongside of this adequately higher pricing of commercial fuels (with of course subsidised low pricing for the poverty sector of our countries) to ensure the economic and efficient use of our energy, are measures that we should take here and now in reducing wastage of our fuel resources in the Third World. Given the ways in which we are using our wood fuel there is a real chance that we could lose our forests by the end of the century and make of the Third World for the most part an arid desert. Can we immediately ensure that for every tree that is felled, there will be a replant. Again in our transport we waste 90-95 per cent of the fuel in the over use and inefficient use of the automobile. There is need for careful urban systems Planning, including a public transport system which can reduce unnecessary motorized travel. We can, as I will later point out, walk more,—and not wait till we over eat and get fat and walk for exercise. In fact it has been computed that the average US citizen spends 1,600 hours annually in his car to travel 7,500 miles. This is less than 5 miles an hour, which is walking speed, walking which also has the added advantage that you can go where you like, when you like, enter any place you like, which no

energised transport machine can do. Again in the commercial energy used in our industries, starting with our thermal power plants, there is over 60 per cent of energy waste. Recycling which is one means of conserving energy has not started except in the non-ferrous metals industry, where it has already effected a 20 per cent fuel saving. The domestic sector energy wastage is also correctible. Energy policy in the Third World must thus aim at reducing, even to some extent to start with, the current waste of energy.

Energy/Fuel Futures

There is one more general issue that I wish to raise with you, particularly with the participants in this course from the Third World countries—and that relates to the alternative energy and fuel futures that we wish to opt for. Because for us in the Third World, there are the three alternative energy/fuel models that we can still choose from, only because our energy consumption is a very low one less than 1 per cent of the world energy supply, as I explained earlier. I will summarily place the 3 alternative energy/fuel futures as I conceive them, that is open to us in the Third World.

Model I would be growing and high rates of per capita energy consumption, along with high efficiency of energy transformation, transportation and communication, invovling very careful and I believe using management of scarce and dwindling fuel resources.

Model II would also be growing and accelerating rates of per capita energy use, along with a gradual phasing out of mechanical energy, calling for the retooling of all industry, primary, secondary and tertiary, to attain the objectives of thermo dynamic thrift.

Model III would be a low energy technology, with a social and individual ceiling on energy use, with its consequences for labour intensive institutional structures and the choice of life styles and cultures that would make possible.

My bias, as an economist, a democrat and one committed towards a less unjust society within our countries, is, I believe, already clear to you. May I express the hope that most Third World countries which can still make the choice of a low energy society, and which will call for more, much more energy in the form of both conventional but much more bio-fuels use than at present, will choose the minimum which is also for us, the optimum energy economy, with its consequential social policies and human and economic priorities. For instance, the fuel consumed in 2 minutes of a rocket launching a satellite can meet 6 months of the energy needs of a country like India, or the fuel used in the transportation sector alone in one industrialised country is equal to all the energy used in the two most populous countries in the world - which, *per contra*, means using fully our tradition of walking to get wherever we want to get, cycling if we want to get there faster (noting the Chinese demonstration of cycling their way into socialism), and using our bio mass conversion resources in which we have a tradition and to which our scientific research and technological development should now be geared.

Bio fuels and Productivity

It is within this optimum energy frame, that I turn to the question of the productivity of bio fuels—bio fuels which are for me intimately linked with the realisation of what I have described as Model III. Limiting myself to the plans, which I am sure you have discussed, examined and reviewed at this training course, to produce through photo synthesis large fuel supplies in the form of plant tissue with more efficient use of solar energy, and the organic materials which can be converted into high content fuels, trees, grass, water plants, as well as gases,—carbon dioxide, nitrogen, hydrogen and oxygen as well as oils and solids, through appropriate chemical processes, there is some question as to the economic efficiency of the photo synthetic process. Some of my economist colleagues in the US, referring to organic fuel farms, which is the recycling of the land to preserve the energy supplying potential of forests, dismiss the photo synthesis process as "very inefficient", and they mean something very specific in this characterisation. They point to the conversion efficiency of a coal fired electric generator plant and that of a steam turbine which is the highest at present at 40 per cent each to that of a gasoline engine in a car or an electric motor which is 25 per cent each, to that of a piston steam engine which is 10 per cent, while the efficiency of energy conversion of solar power and the resulting photo synthesis is 0.33 to 3.33 per cent. Apart from querying some of the perameters on which these estimates are based, let us straight away admit that research should be directed to improving the conversion efficiency of the products of photo synthesis and I would hope that is one of the important points of research priorities that has emerged from this meeting.

Land Plants

But even at the 3 per cent conversion efficiency, the trees, grasses, plant tissues and other organic materials produced through photo synthesis can meet our growing energy needs—for two reasons. First the amount of land area that it will need is less than 1 per cent of the total land–not necessarily cultivated land–in our countries. For a large country like India or China, somewhere between 9 million acres for India and 12 million acres for China can provide the entire current energy needs of the two countries. The second is that for us in the Third World, the products of photo synthesis in the form of vegetable waste, fuel wood and grasses are already massively in use in our society as energy sources. In this country, in addition cow dung and in China human excrescence, dried in the sun have been in use over centuries while the simple technology of the bio gas and gobar gas plant reconciles their major critique of the misuse as fuel of what could be a very valuable fertiliser (India's 400 million tonnes of wet dung could produce annually the same fertiliser output as 8 of our largest fertiliser plants). Thus there is no need for new technology to induct our rural households in the feasibility of using these photo synthetic products. Only we need constantly to improve on their production through intensive farming of grasses which can yield 13 to 15 tonnes per acre and an intensive tree planting programme which will both maximise yield per acre and provide us with a replenishing source of energy.

Water Plants

There is need to back up the photo synthetic products from land with those from the sea, river and lakes. With the

growth of population in the coming two decades, the cost of fertile or even unfertile lands, irrigation, fertilisers, land preparation, transportation and, I very much hope, that of labour will rise to the point where the economic viability of land plants will have to be examined afresh. Hence it is necessary now to intensify research on water plants, on which again our rural people have more traditions than we realise. They know and use blue algae, green algae and what in this country in Kerala's rivers and lakes is known as African fern. And then there are as yet the unplumbed depths of ocean plants. Much of this photo synthetic material is allowed to go to waste or to lie unused particularly in the case of the photo synthetic products of the ocean when they can be an important and renewable, clean and sane, fuel and energy source for our people. Here again studies and development research are needed.

Total use of bio fuels

I end with a simple but important note on the engineering economics of bio fuels. Even as we chart the areas of investigation and research in these so called non commercial energy sources (this term, non commercial energy sources, is like giving a dog a bad name and then hanging it), I prefer to call them non fossil energy alternative, we must ensure that the fullest and least wasteful use is made of our existing bio fuel sources. I have earlier pointed to the ways in which we are using rather misusing our forest resources and that applied to our use of our grasses and land plants also,—involving a great deal of waste of potential fuel. It is only recently that we have begun to apply the concept of total energy to a few plants. The sugar cane plant after crushing is begining to be used—every part of its remains which we in this country call bagasse—as paper pulp and as a raw material input for the manufacture of alcohol. The same is true of the paddy plant used as fodder, and bran oil. We need to extend the Total Energy concept from electricity generators to all fuels, so that the photo synthetic wastes are used fully. If the Total Energy system can near double thermal plant efficiencies from 40 per cent to 75 to 80 per cent, I am convinced that its extension to the products of photo synthesis can increase their conversion efficiencies from the 0.33–3.33 per cent present plateau to some where near about 3–6 per cent. Bio fuels can thus not only be economically efficient, they can help us to turn around from the exhausting and enslaving effects of energy excesses to a sane, sufficient and equitable social system.

That is my hope.

And that is the word of Valediction with which I conclude.

BOOK - REVIEW

Title : Rural Primary Education and Adult Literacy in Tamil Nadu

Author : Mr. Alexander Joshua

Publisher : Sangam Publishers, Madras-600 001 for Madras Institute of Development Studies, Madras-600 020.

Number of Pages: 156 Price: Rs. 24-00

Economists have empirically established that education is a major and vital factor of development in various fields and sectors. Among the educational levels, primary education forms the foundation for other educational superstructures. Since our country is predominantly rural in nature, rural primary education demands priority of our attention. This book deals with this priority area. This publication abounds with essential statistical data. As pointed out vividly in the preface by Dr Malcolm S Adiseshiah, the plus points and pitfalls of the primary education system are discussed thread-bare. The problem of wastage, the various methods of computing wastage, the causes of wastage are dealt in a separate section. With a view to identify the week-zones especially in relation to wastage, district-wise rates have been computed.

Adult literacy and primary education are basically twin aspects of one and the same operation. Successful primary education system leads to better rates of adult literacy. These are inter-twined like the convex and concave of one and the same circle.

Any insufficiency or inefficiency in the primary education system leaves its echoes in the sphere of adult literacy. As the literate adult population forms the base line force of all economic, social, political and cultural activities, due emphasis is laid on the aspect of adult literacy in this book. The issue of illiteracy is telescoped from the global figures to the figures pertaining to Tamil Nadu. Here too, the growth trends of literacy are traced districtwise from 1951 to 1971. The positive correlation between illiteracy and wastage at primary levels is significantly brought out when the district rates of wastage and illiteracy rates are compared. The dichotomy in literacy rates in rural and urban areas, the rates among males and females and the rates relating to the SC and ST people and non-SC and ST people are also depicted. The careful analyses of the author bring out the need for priority treatment to be bestowed on the rural, SC and ST, and female sectors in our literacy programmes.

In the last section on recommendations, 12 valuable suggestions on primary education and 8 valid suggestions on adult literacy, covering the aspects of content, methodology, administration and management are given. Some of the foreign models are also described for consideration and adaptation.

This book has been brought out after substained research and deep thinking. I am positive that Mr Joshua has added a very useful book to the growing library on this important sphere. This book will be a 'must' not only to students of education but also to educational planners.

K Venkatasubramanian

BOOK - REVIEW

Title : Land and Water Resources of Coimbatore District

Author : Prof. R. K. Sivanappan & Dr. P. K. Aiyasamy, Tamil Nadu Agricultural University Coimbatore, 1979.

This monograph on "LAND AND WATER RESOURCES OF COIMBATORE DISTRICT" is an empirical analysis of the two basic constraints of poor land inadequate water supply on the process of economic development of Coimbatore district. Though endowed with only scanty rainfall, and limited supply of ground water and poor soils the Coimbatore, the largest district in Tamil Nadu accounting for 60.61 per cent of the entire population of Tamil Nadu is ahead of other districts in Tamil Nadu regarding industrialisation and economic development. According to the authors this however gives no room for complacency but greater vigilance and concerted efforts for a more rational land and water-use in the years to come for substained economic progress.

The book is divided into eight chapters entitled Introduction, people, land, water, land and water use, past and present, land and water demand, future projections, Technology for land and water use efficiency and suggestions and policy issues.The crux of the study is developed in three chapters Land and water use, Land and Water demand and Technology for land and water use efficiency. The present utilisation of water is computed to be 3.80 lakh hm and the projection for 2000 AD is 4.80 lakh hm and hence an additional quantity of 1.00 lakh hm would be required. It is suggested that the additional quantity has to be got by importing water from neighbouring states and by utilising the available water in a judicious manner.

As a policy issue the main recommendation of the monograph is the creation of a separate agency namely Water Resources Agency for chalking out short term and long term policies on water and land use. This agency is to integrate the multiplicity of State, national and inter-national agencies operating at present at the local level.

The monograph has collected extensive data regarding the problem and marshalled the same in a meaningful manner to support its findings.

The language is tersc and simple and the monograph should prove useful to district level planning and policy making.

Dr. P V Rajkumar